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*Edited by*

**Nirmal Kumar Bose**

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## **PUBLICATIONS**

**Works  
of  
Sarat Chandra Roy**

1. The Mundas and their Country
2. The Oraons of Chota Nagpur
3. Oraon Religion and Customs
4. The Kharias, 2 vols.
5. The Birhors
6. The Hill Bhuiyas
7. Caste, Race and Religion in India

A few copies of *The Oraons of Chotanagpur* are available at Rs. 50. *Caste, Race and Religion in India* is also available. Price : Rs. 10.

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## CULTURAL RELATIVISM

NIRMAL KUMAR BOSE

I am deeply grateful to the organizers of the Indian Philosophical Congress for giving me this opportunity of discussing with them the important subject of Cultural Relativism. But I am suffering from a feeling of uneasiness. In anthropology, we use the term Culture in a sense which is slightly different from the way in which it is popularly used ; so that the meaning of what I am going to say may remain unclear at points. I would therefore pray for your indulgence while I try to deal with the subject matter from our point of view as an anthropologist.

The term Culture is used in anthropology in a rather broad sense. It includes the products of the mind, as well as such tangible and intangible objects as arise from the pursuit of various aims in social life. Thus, material objects like tools, houses and settlements, or institutions through which human labour and interpersonal relationship of various kinds are organized, as well as language by means of which one communicates with another, and art and religious beliefs which enrich human life in many ways, are all included within the broad compass of Culture.

An anthropologist usually works among communities which are markedly different from his own. But in modern times, there has been a tendency to apply the methods of observation, comparison and historical reconstruction to one's own culture in the manner in which they have been hitherto applied in the case of primitive peoples. The dividing line between social anthropology and sociology has thus

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Address delivered at the symposium on Cultural Relativism, Indian Philosophical Congress, Patna, 29 December 1968. Published through the kind permission of the Secretary, Indian Philosophical Congress.

become indefinite, and we believe that this has been to the advantage of both the disciplines. This has naturally brought about a refinement in our methods of observation. More attention is now paid to the ideals and aspirations which lie at the bottom of human institutions, and the manner in which they also change in course of time.

In order to illustrate how this is done, let us take up the case of one social institution with which everyone is familiar in India. This is the caste system which forms an integral part of Hindu culture, and to which many anthropologists have devoted their attention in recent times. Those who have carried out detailed investigation in the field have reported how our villages are subject to poverty and social inequality, and yet how they cling to a productive system which is neither capable of feeding them adequately nor of assuring sufficient employment to everyone who wishes to work. Attempts have, of course, been made to improve agriculture, introduce modern industries, spread education and social services by both official and non-official agencies. But either the total efforts have been too meagre, or they have been thwarted again and again by the hold which tradition and caste seem to have upon the people. This apparently inexplicable conservatism has led many anthropologists to enquire deeply into the nature and functions of the caste system. Different authors have arrived at different conclusions, and I shall try to present the findings of one such school by way of illustration. The broad findings of this school will be indicated, while the questions which arise out of their enquiries will also be described.

According to this school, caste is sustained by an organization of production which is based on hereditary monopoly of occupations assigned to distinct social units which are endogamous. These units are again arranged in a hierarchy formed by privileged and unprivileged classes. Competition is deliberately discouraged, while mutual assistance is encouraged in a manner regulated by tradition, and not by law. It is also to be noted that, in the past, this productive organization depended upon manual and animal power as its principal sources of energy. Apparently, such a productive system has been found unsuitable for catering to the needs of a growing population, or to the rising demands of a higher standard of material comforts,

In contrast to the capitalistic mode of production based upon competition and freedom of enterprise, caste is thus a non-competitive system. One can perhaps complain that by its means people shared their poverty instead of trying to secure plenty for everybody. But it was this act and tradition of sharing which was held to be important; and people consequently clung to it in spite of the obvious inequality which existed between different elements of the hierarchy.

It should also be remembered in this connexion that when production depends largely on human or animal power, the discrepancy in wealth cannot grow to such fantastic proportions as it can under modern conditions when mechanical power is employed. Even so, Hindu society set up another ideal in order to counteract whatever inequality might arise in ancient times. Instead of showing respect to men who accumulated wealth, more honour was bestowed upon men who spent conspicuously. Many stories are current in order to impress the lesson that those who give are more blessed than those who store.

One may naturally raise these questions : How far did people living under caste actually abstain from competition ? How oppressive were the actual results of dividing society into privileged and unprivileged classes ? Did conspicuous expenditure sufficiently ease the situation arising out of economic inequality ? And, lastly, did the ideals thus built up in the culture persist because of intelligent participation and assent, or did they continue on account of blind and unintelligent adherence ? If it were the latter, was it not more harmful for the individual in his spiritual growth than the discontent and restlessness and even cruelty which are apparent in the capitalistic order of society ? Is not *rajas* better than *tamas*, if we are to use terms made familiar by Indian sacred literature ?

These are indeed legitimate questions, but they are, in substance, questions relating to history. Our purpose today is to delineate in a broad sweep some of the working ideas underlying caste. We have already suggested that the desire to restrict competition and promote mutual assistance were two such ideals which were held to be of great value. At least, they had stood the people of India in good stead when king fought against king, and large-scale inter-provincial commerce became temporarily dislocated on account of these wars.

Even in the present age, when no more than 4 per cent of our working population has been able to find a place in modern industries and only another 6 per cent in 'household industries', the rural population of India still finds that the economic organization of caste is a dependable and helpful institution. If there is not enough room in a steamboat for all passengers gathered at a ferry station, and if they take recourse to country-boats in order to cross a river, they are indeed justified. They do so, not because they are conservative by nature, but because it is more practical to do so under the circumstances.

But this capacity of caste to help people to survive in spite of political vicissitudes was not its only merit. There was another element in it to which attention should now be drawn. When different communities were drawn into the caste system and assigned monopolistic occupations, at least in theory, they were also encouraged to confine marriage to their own group. There was a total control of men's economic and social behaviour. At least it was so in theory, and also perhaps largely so in practice. But in compensation a kind of freedom was assured to the federating units. This was the right to pursue their religious beliefs and ritual practices without let or hindrance.

In our opinion, this freedom largely took the edge off the discontent which arose from economic or other forms of social inequality. Whether this measure of cultural freedom was granted to the federating communities because the Brahminical leaders of society believed in such freedom or because they wanted to keep the subordinated people pacified is a matter of historical investigation. But there is clear proof that the Brahminical people did believe in the right of existence of different cultures side by side, provided the communities concerned were bound to one another at the economic level by an acceptance of the ideal organization of caste.

There is an accepted proverb in Hinduism that there are as many religions as there are men. Each man's spiritual needs are distinct; and the faith by means of which he lives, or the inner ordering of life which he builds up on the basis of that faith, are bound to be different, ever so slightly, from those of others.

This cultural pluralism, if we may use that term, was an important element of Hindu religion. And it has been our belief that it was not merely the non-competitive character of caste's

economic organization but also the cultural freedom associated with it which has given such a long lease of life to it in the midst of abundant political changes.

Ladies and Gentlemen, I am sorry that I have taken an inordinately long time in order to describe some of the important elements of Hindu culture with which we have been confronted in course of our anthropological studies. But let us now quickly pass on to the more vital question as to how to assess the value of these ideals. Are they good? Should they be preserved? Let us, therefore, deal a little more with the history of contemporary events.

There is no doubt that in India today a great moral urgency has arisen in both our social and political life. After having witnessed what is happening all over the world, how the application of science can potentially assure plenty for all mankind, how inequality hurts, we have set our minds upon the creation of a new civilization which shall be caste-less and class-less, and in which every man shall be assured of a decent standard of living, even if it may not be immediately one of plenty. In this moral adventure, we find that the desire to remain satisfied with a low standard of living, as in caste-bound rural India, is a serious obstacle. Many are of the opinion that there should be a healthy discontent; also a unity of purpose which can only be assured by discarding cultural pluralism and having one culture instead. In the past, Nationalism tried to promote this monolithic cultural system in place of the numerous small cultures which kept a community divided within itself. Today, Socialism of one type or another has also come with its demand for commitment to the ideals of Humanism and Secularism which are to take the place of a new religion.

Although we have tried to present in outline two value-systems which have come into confrontation with one another in India today, let us look once more into the historical circumstances under which each system arose. About this a few hints have already been given in the previous paragraphs. Yet, we shall try again to gain a clearer understanding of the nature of their conflict from the historical point of view.

It appears to me that the ideal structure of caste was designed deliberately over a period of time when the problem was to incorporate a number of distinct communities into one social whole. Some of these communities were conquered, some were conquerors;

while others were drawn into it by virtue of its productive efficiency in contrast to simpler modes of production prevailing among hunters and fishers or shifting cultivators. Under these circumstances, suppression of the competitive tendency was looked upon as a worthy ideal. Co-existence of cultures was encouraged. It was held that each culture represented only a fractional view of Truth, and moreover that these fractional views of Truth changed from time to time. Quite often efforts were made to define certain Eternal Truths ; but their interpretation by Colleges of Brahmins tended to vary in accordance with the needs of the hour. In such a society, conformity to established custom was promoted ; obedience encouraged. The State and family organization also encouraged this obedience. But in ancient times the organization of the State itself was weak ; so people obeyed the rules of a totalitarian society on religious grounds and by means of voluntary acquiescence. But if there was a freethinker, if anyone felt that his creativeness or inner being was cramped by subservience, there was a safety valve in the shape of *Sannyasa*. *Sannyasa* released a man from the bondage of society, if he was prepared to pay the price of freedom in terms of voluntary poverty, and a surrender of the desire for social security.

Today, after we have witnessed the achievements of Europe and America and also of the socialist countries all over the world, many Indian thinkers have begun to feel that free enterprise, the desire to break away from tradition, to deviate, are better exercises of the human spirit. Conformism is wrong, subservience to tradition is wrong, a commitment to secular values like the eradication of poverty and disease, a desire for increasing material prosperity, are better than a doubtful gain from subservience to an other-worldly religious ideal, or even the desire for personal emancipation from the bonds of sorrow by the pursuit of the goal of Spiritual Liberation.

It is also being increasingly believed that the desire to have a single homogeneous culture for the whole of India is better than another which encourages pluralism. A pluralistically divided society is weak in war. And what matters most in the present warring world is the capacity to survive. And thus co-existence of many fractional views of Truth is outdated, for we must forge a new unity for both economic development as well as for defensive purposes.

What I have been trying to suggest by the contrast presented above is that the values of traditional Hindu culture and the new ones towards which we have apparently been leaning are both *products of human needs as they have been modified under the pressure of historical circumstances.* The needs have not remained constant ; but have themselves become altered on account of the pressures under which men live. Both of the value-systems are therefore valid and justifiable under the circumstances under which they arise and operate.

This is where an anthropologist finds it difficult to say whether one way of life, or one particular culture is superior to another or not. If a society grows big in population, if the seams of its civilizational coat begin to burst, the people concerned take recourse to new ways of life, to new values which would help them to survive and prosper. These new values may arise internally, or they may even be borrowed and adapted from other cultures. But at every stage, we discover that the members of a community try to ascertain the value of their own past and present ideals and compare them with one another, as well as the cultures of those with whom they historically come into contact.

When we look at their exercises at assessment, we begin however to realize that these assessments are intensely coloured by the pressure of their emergent needs.

It has often appeared to us that cultures cannot be arranged in a hierarchy, one being regarded as *superior* to another. They can of course be classified and arranged in a horizontal series. For the sake of comparison, one may refer to the subject of Human Ecology. An Eskimo builds up his culture according to the demands of his environment. So does a pastoral nomad in the desert, and a peasant who lives in the alluvial plain of the Ganga. We can describe each ecological response, we can arrange them in a grade for purposes of classification and understanding. But is there an Absolute Measure in terms of which they can be evaluated ? Are they not each right in their own environments ? Yet, it must be admitted that efforts have been made at their evaluation. Some have been regarded as better than others. But if we examine these judgements carefully enough, we discover that the measuring rod which is applied is itself, almost in all cases, the product of the contemporary needs of the people or society which exercises the judgement.

Thus we are eventually confronted by a very difficult question : Can there be a totally objective comparison between values ? Can values be evaluated ? Can we arrange them for the sake of comparison like flowers torn away from their living context, from the context of the historical circumstances under which each has arisen ?

Let me confess to you frankly that I do not know the answer, although this is a question which has haunted me again and again as I have tried to understand and then compare one tribal culture with another, or one culture with a second one from which it differs significantly.

Even with regard to Hindu culture, every student knows very well that, in the past, there was a considerable succession of values. Not that each such new value became widely acceptable ; but when deviant values arose and became enshrined in the behaviour of small companies of men who formed sects, it meant that the established values, honoured by the largest number of men, were not sacrosanct. In other words, human life was not completely paralysed by blind obedience. It was capable all the time of throwing up deviations, which eventually could be the starting points of new patterns of behaviour, new beliefs, i.e. of a new culture altogether.

One can recall the conversation which Chaitanya is reported to have had with Rai Ramananda when the former first met him during his pilgrimage to the South. When Chaitanya asked Rai Ramananda, What should a man do in order to gain the Highest ? Rai Ramananda's reply was that the performance of one's duties as defined by the rules of *Varna* should be his highest aim. He should act unselfishly, and with a spirit of dedication to God. Chaitanya replied 'This is external, superficial. Say something which is deeper.' Rai Ramananda then proceeded to describe the attitudes and exercises of the spiritual aspirant, until finally he said that it is in our effort to realize the love which the Divine has for his Consort that the highest aim of human life is located.

To Chaitanya, obedience of the rules of society, and conformity, were only like the outer husk. It was the inner commitment to some transcendental value which he regarded as the supreme goal of life. But if a man becomes committed to some such goal, is he any longer in a position to judge the little values of others ? From his own point of view, Chaitanya regarded them as husk, but the husk is of value

to the seed which grows and matures within. When growth is over, the cover which protected it becomes husk, becomes a bondage which has to shed. And the sooner this is done, the better.

It is perhaps from this point of view that we should look at cultures and their values as enshrined in institutions with an objectivity of mind. We have to lay aside the measuring rods furnished to us by our own society, or even by ourselves. And then we begin to realize that all cultures and all values to which men temporarily subscribe have a tinge of evanescence enshrined in them. And looking at it historically one ceases to judge, and feels overwhelmed by the succession of cultures or civilizations, both in space and in time, as an endless procession. One feels overwhelmed like Arjuna when Krishna opened up before him the sight of the Universe in flux ; a sight which frightened Arjuna and so he wanted it to be withdrawn, and replaced by the image of God *as he wished to see Him* : benign, friendly and merciful.

Perhaps History also opens up before us a vista which is no less disturbing than the one which Arjuna sighted. All that we are then left with is that *when we begin to understand, we cease to judge.*

# THE PASUPATINATHA TEMPLE : NEPAL

AMITA RAY

( Received on 22 August 1968 )

**Abstract.** The paper is a study in historical sociology of the temple of Pasupatinatha at Kathmandu, Nepal. It presents a few facts not known hitherto, drawn from archaeology and on-the-spot survey, and attempts, in the main, altogether a new interpretation of more or less known facts.

The main thesis of the paper is that the temple was originally affiliated to Tantric Saivism in which was incorporated elements of ritualistic practices derived from primitive and tribal religions. But by about the middle of the fifteenth century the nature and character of the temple underwent a change, especially in ritualistic aspects of worship of the main deity, the *Mukha-lingam* installed in the sanctum, at the instance of Bhattacharya Brahmin priests who were imported from South India by King Yakshamalla. Since that time the temple has to this day been under the control and protection of Bhattacharya Brahmins from the South, who still happen to remain a closed community marrying among themselves and having no social relations with the indigenous population of Nepal. The temple is thus a unique one in Nepal in ritualistic worship, its relatively purer *Smarta-puranic* Brahminical outlook, as distinguished from Tantric, its strictly Brahminical and priestly character and its exclusiveness. From the point of view of the Nepalese themselves the temple stands aloof and apart from the main stream of their life which is relatively free from the domination of caste and of priestly Brahminism, and is pervaded, so far as their socio-religious observances are concerned, by Tantric rites and practices.

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The paper seeks to find out the reasons of the uniqueness of the temple and of the features that characterize this uniqueness, by analysing available facts of history and archaeology and contemporary socio-religious data with special reference to socio-religious rites and practices that obtain at the Pasupatinatha and other temples of Nepal.

## I

**T**HE temple of Pasupatinatha holds a peculiar position in the religious life of Nepal. It is a shrine that enjoys the authenticity of antiquity and is held in great veneration by the people ; yet at the same time the shrine seems to stand aloof and apart from the general tenor and temper of their life. The priests of the temple are Brahmins imported from South India, who continue to maintain their marital ties within their closed community ; the *puja-vidhi*, that is, the rituals of worship that are current in this shrine are widely different from those that are usual in all other shrines in Nepal, including shrines that are dedicated to Siva-Pasupati. The shrine therefore presents an interesting study in sociological history, which this paper proposes to take up.

## II

In the absence of any dependable record it is difficult to ascertain when the shrine of Pasupatinatha was originally built, or who the original builder was. The earliest authentic record known so far is an inscription of King Manadeva, dated Samvat 413, which refers to the installation of a *Siva-lingam* in the courtyard of Pasupati.<sup>1</sup> A little over half-a-century later another inscription of the reign of Vasantadeva and dated Samvat 455 refers to *Pasupati-kshetra*,<sup>2</sup> evidently as a holy site. The great Amsuvarman described himself as *Pasupatipadananugrihita*, blessed by the feet of Pasupati. He is also known to have been responsible for making a considerable number of donations to and for raising a number of smaller shrines around the main temple.<sup>3</sup> The main shrine thus seems to have come into existence not later than the middle or third quarter of

the fifth century A. D., evidently along the rising tide of *Smarta-puranic* Brahminism which seems to have made itself felt in Nepal in the context of close Indo-Nepalese contact. Indeed it seems clear that the cult of Pasupati-Siva was made popular in Nepal during the regime and perhaps by the kings of the Lichchhavi dynasty.

The sanctum of this shrine is occupied by a *Mukha-lingam* which, stylistically and iconographically, resembles the well-known *Mukha-lingam* of the Nachna Kuthara temple of early Gupta days. There is also an image of Pasupati which one now sees installed near the main gate of the shrine; nobody seems to know its original position. Here too, its stylistic affiliation with the Gupta-Vakataka sculptural tradition, is unmistakable, though it may be somewhat earlier than the *Mukha-lingam* itself. This is nothing surprising in view of the fact that recent archaeological findings in the Kathmandu valley have confirmed what was somewhat vaguely recognized before, namely, that the Lichchhavis enjoyed very intimate relations with the Guptas on the one hand and the Vakatakas on the other, and that Nepal was in close contact not only with the Ganga-Yamuna region but also with the Deccan. That the Pasupatinatha temple had come to occupy an important place in the life of the people of the Kathmandu valley, at any rate, seems to be proved by the fact that during the rule of the later Lichchhavi kings villagers are recorded to have offered their voluntary services for the digging of a *maha-pranali* or moat around the shrine.<sup>4</sup>

The God Pasupati and his shrine seem to have enjoyed this support and patronage uninterruptedly for centuries. But unfortunately we do not have any evidence to tell us as to who the priests were, or what the rituals and the religious nature and character of the temple itself was.

But from a close study of the temple and some of the features of worship that persist even today, one can perhaps make a reliable guess as to what the nature and character of the temple was up to the middle of the fifteenth century.

A scrutiny of the architectural features reveals that on the second storey of the temple there is still a *Bhairava-chakra*

which definitely associates the temple at once with Tantric Saivism. Secondly, there are four supports of the main roof of the temple, and on each of these supports one can easily notice an image of *Unmatta Bhairava*, the specific iconographic feature of the image being *Meshambara*. This also at once affiliates the temple with Tantric Saivism. Thirdly, one of the most significant rituals connected with the worship of the main deity of the temple is as follows. The temple has four doors, one at each of the four cardinal points. Every morning these doors are opened at about eight, but before this formal opening is made the main deity is worshipped within closed doors by a Nepali priest who enters the temple by the western door and then closes it, and who happens to be a Vaisya (all Nepali Vaisyas of today were originally Sudras) by caste. The temple is thrown open to the public only when this early morning worship is over. Fourthly, one of the features of this early morning worship is the tying of a rope with the *Lingam* and taking the other end of the rope through an opening, about half a furlong away from the precincts of the temple, where offerings of liquor and animal sacrifices are made on special occasions. There can thus be hardly any doubt that at one time the temple was connected with Tantric Saivism as known and practised in Nepal.

The shrine seems however to have suffered a great set-back some time in 1350 A. D. when Shamstiddin, the then Sultan of Bengal, invaded Nepal and advanced to Kathmandu where he seems to have ravaged the temple, among other things, and ransacked it. The *Gopalarajavamsavali*,<sup>6</sup> a chronicle compiled perhaps in about the fifteenth century, refers to this incident as an unpleasant memory of the past ; but by the time of the compilation of the chronicle it had apparently already outlived the shock and was enjoying a new lease of life. This text affords an illuminating commentary on the socio-religious life of Nepal in the fourteenth century. It records that the divinity was held in great affection and devotion by the people. From its testimony it seems that Pasupatinatha was virtually, if not literary, the guardian deity of Nepal. But what seems more significant is the fact, casually mentioned in the chronicle,

that during the reign of King Yakshamalla (1150-80 A. D.) two Bhattacharya Brahmins were brought from South India in order to officiate as priests at the Pasupati shrine.<sup>6</sup> A later king, Jayasthimalla, is also known to have inducted two Bhattacharya Brahmins from the South, ostensibly to prepare a new codification of the social laws of the country, we are told. Any student of the socio-religious history of Nepal knows that it was from about this time that one starts noticing the slow but steady beginning of a kind of social stratification based on the traditional Indian system of caste to which the earlier Buddhist-Brahminical society of Nepal fell an easy prey, perhaps slowly and gradually but inevitably. The inference becomes irresistible that the social pressure which was responsible for the induction of Bhattacharya Brahmins from the South for officiating as temple-priests and for a new codification of social laws, was also responsible for the introduction of a neo-Brahminical culture of mediaeval South Indian imprint, based on the system of Brahminical priesthood and of caste.

It may not be idle to speculate as to the reason why it was found necessary to import Bhattacharya Brahmins from South India as temple-priests or as codifier of socio-religious laws. Was there any historical or sociological reason for doing so? In the absence of any factual data one can only try to build up a working hypothesis.

### III

Nepalese society, it is well known, affords a unique example of the co-existence of Buddhism and Brahminism in a manner which has hardly any parallel anywhere else in South and South-east Asia, and this even from earliest recorded times. Perhaps Bihar and Bengal of the time of the Palas, more specifically of the early Palas, approximated somewhat to what one may reconstruct of Nepalese society, not only in early mediaeval centuries but also later on down to our own times. One knows too well that Amsuvarman of the seventh century was an ardent Saiva, a devotee of Pasupati, who made a number of donations to Buddhist *viharas*. Epigraphic evidences of this nature are however very infrequent in Nepal, but what is more

significant is the evidence of archaeology which clearly demonstrates the unmistakable co-existence of the two religions. In any important religious establishment in Nepal that has been in continuous existence through the centuries, one finds not only Buddhist and Brahminical shrines standing side by side, but also the divinities of both the cults co-mingling in such shrines in a manner that one does not usually find elsewhere in India or in South-east Asia. Indeed, if one observes carefully one easily finds that an average Nepalese hardly makes any difference between an image belonging, iconographically or ideologically, to Buddhism or Brahminism; both have the same meaning and significance in so far as he is concerned, and he is not even conscious that historically speaking they owe their origin and evolution to differing social and ideological situations, nor of the fact that both the religions had woven into the texture of their behavioural pattern, a great deal of beliefs, rituals and practices of primitive religions of pre-Buddhist and pre-Brahminical days. Historically speaking, the introduction of Buddhism seems to have preceded that of Brahminism by a few centuries, and even after this introduction, both flourished side by side, which certainly means that they had a considerable support among the people, that is, enjoyed a wide social base. The fact that we do not have court documents to support this contention has to be explained by another fact that the court was more often than not Brahminical, either Saivite or Vaishnavite. But apart from the evidence of Buddhist sculptures and paintings, any social survey would show very clearly that people in general were, through the ages, and even now are, very firmly rooted in the traditions and practices of Buddhism. Yet at the same time perhaps because of continued co-existence and co-mingling and perhaps also because of the primitive base of certain ideas, beliefs, rituals and practices the Buddhists, that is, the devotees of Buddhist gods and goddesses, could easily take to the gods and goddesses of the Brahminical pantheon and the rituals connected with their worship. This process, slow but steady, seems to have been at work through the centuries,

and the vast generality of people became 'Hinduized without being Hindus'. In the process what was silently achieved was a unique syncretism of cults, primitive, Buddhist and Brahminical, an equally unique harmonization of beliefs and practices, and what is more important, evolution of common rituals of worship. Thus was evolved a homogeneous socio-religious culture in Nepal which was not disturbed even when Brahminical cults, mainly Saiva and Vaishnava, but at a later stage also Sakti, introduced themselves and staged movements of revival with some amount of vigour. In fact, through the centuries, Nepal seems to have worked out a peculiar syncretism out of the ritualistic practices, and perhaps also of beliefs of Siva and Sakti cults on the one hand and of Vajrayana Buddhism on the other.

Yet a stronger and much more pervasive socio-religious force was yet to come, which by bringing together and synthesizing apparently disconnected facts and fragments of experience of life into one whole, removed altogether whatever vestiges of isolation and segregation were still there in the socio-religious life of Nepal. This force was represented by the Tantra which came to pervade all Buddhist and Brahminical cults. The synthesis that we have just spoken of had already been achieved when Sultan Shamsuddin struck at the Pasupatinatha temple in 1350 A. D. and perhaps somewhat long before Bhataraka Brahmins were brought from the South as temple-priests and codifiers of socio-religious laws.

One of the potent factors that may have helped this synthesis was the caste-less character of the society, presumably a contribution of tribal society and of Buddhism. One significant fact in favour of this assumption is that even today temples and religious shrines in Nepal are in general free from the dominance of Brahminical priests and all temples are open to all castes and creeds. A second significant fact is that caste as a social phenomenon is practically absent among the indigenous elements of the population but happens to be an important factor in the life of those whose ancestors had entered Nepal as immigrants from India at different periods of time.

The Pasupatinatha temple today presents however a situation that belies this picture of Nepalese society. Even a casual observation of day-to-day life at the temple would reveal to any one that the countless people who come to this temple to offer worship, do not actually act and behave as active participants as they do in other temples, but they stand somewhat aloof and apart as silent but devoted and respectful observers. They do not take any part whatsoever in the rituals of worship ; indeed they are not allowed to. Secondly, the priest here is invariably a Bhattacharya Brahmin who alone has the right of entry into the *garbha-griha*, a feature which is unknown in any other temple in Nepal. Thirdly, this is the only temple in Nepal which is open 'Only for the Hindus', the term 'Hindus' here fortunately does not exclude Buddhists. But even so, this kind of exclusiveness and segregation are features which are not usual in Nepalese society nor are they recognized by the Nepalese people as anything but very exceptional.

#### IV

What has been stated above perhaps gives a sure indication that in the context of Nepalese society the Pasupatinatha temple, as we see it today, is a unique phenomenon, but it does not offer any clue as to why and how it came to acquire this character, nor does it explain why it was considered necessary to induct Bhattacharya Brahmins from the South to act as priests of this temple and to prepare a codification of the socio-religious laws of the country, presumably on the basis of caste as known and practised in India. One cannot miss the fact that Jayasthimalla who is said to have brought the Bhattacharya Brahmins to codify social laws is also credited with having reorganized contemporary Nepalese society on the basis of as many as eighty-five castes. One may therefore try to find an answer to this why and how.

Religion as practised in Nepal is nothing but a series of rituals that have also a secular or even domestic significance. Gods and goddesses and spirits, both benevolent and malevolent, maintain a very intimate relation with the day-to-day life of the people ; they are supposed to nourish

and satisfy their magical faiths and superstitions as much as their material desires and aspirations. The daily round of an average Nepali is inextricably mixed up with spirits, gods and goddesses and with the rituals connected with their worship, and these rituals are performed with as much faith and devotion as joyousness and festivity of spirit. Indeed the home of a Newar always wears a festive appearance ; their socio-religious ceremonies are almost invariably marked with offerings of liquor and sacrifices of domestic animals. Ceremonial processions or *yatras*, festive gatherings or *samajas* etc., are essential features of such ceremonies in which temples also play an important part. There the people gather and share their joyous abandon with the gods, goddesses and spirits, unconscious of their sectarian affiliations. Indeed, their cycle of life is all but associated with their gods, goddesses and spirits. The birth of a child, the initiation of a boy, the marriage of a young couple, for instance, are all celebrated in temples and often without a Brahminical priest. An analysis of the rituals connected with such ceremonies would show that they are replete with primitive and tribal beliefs and practices of local origin, synthetised with the Brahminical and Buddhist magical ritualism of the Tantra.

Tantra was indeed the most dominant and pervasive factor in the religious life of Nepal from at least the tenth and eleventh centuries of the Christian era. This is proved not only by the evidence of a very large number of Tantric texts found in Nepal but also by an equally large number of sculptures, bronzes and paintings showing unmistakable Tantric influences. It was from about this time also that there started coming into vogue a number of esoteric cults and practices all based on the simple theme of Purusha and Prakriti or Siva and Sakti or Buddha-Bodhisattva and Tara, as interpreted and understood in terms of Saiva Tantra or of Vajrayana, both of which incorporated many elements of magical practice of primitive and tribal origin. Speaking from the point of view of ritualism there was not much of a difference between the rituals and practices connected with the worship of gods, goddesses and

spirits of the Siva-Sakti pantheon and of Vajrayana. Thus was evolved in Nepal a common and unified system of ritualism and a common pantheon of gods, goddesses and spirits. Rajendralala Mitra, in his *Sanskrit Buddhist Literature in Nepal*, refers to a text on rituals of worship, *Puja-paddhati*, which mentions as many as twenty-six Brahminical divinities freely absorbed in the Vajrayana pantheon. Vajrayana indeed seems to have acted in Nepal as a great unifying and synthesizing force. In a situation of this kind, cult affiliations, understandably enough, came to play a very secondary role. Apart from this, Tantric esoteric cults may have also affected society in Nepal to some extent as they did elsewhere, in eastern India, for example. The total socio-religious situation was thus one which could not have been very welcome from the point of view of orthodox and puritanic Brahminism. Indeed, from such a point of view, these must have been considered somewhat degenerate.

It may perhaps safely be presumed that when Yakshamalla acted in the way he did, he was only trying to make the Pasupatinatha temple, the seat of the presiding deity of Nepal, a place of pure and orthodox Brahminical worship of the *Smarta-puranic* type. He wanted to keep the Pasupatinatha temple unsullied by all sorts of magical and Tantric ritualistic practices. His late successor, Jayasthimalla, seems to have gone a step further, namely, that he wanted to bring about a reorganization of society itself.

But in trying to do what they wanted to, why did both of them turn to the South? Perhaps they had a very valid reason for doing so. They could not turn to eastern or western India or to the Indo-Gangetic plain where socio-religious conditions within the fold of Hinduism were very much the same and where, besides, an altogether alien social and religious group was in power. They could therefore only turn to the South. But they seem to have had better reasons for doing so.

It is common knowledge that in the southern region of this vast land, a general movement of reformation and revitalization of Hinduism was going on from about the ninth

century A. D., evidently as a result of the Sankaracharya movement, and reformer after reformer was making his life and work felt in the socio-religious life of the people. In the process many of the evils that had in the meantime crept into Brahminical Hinduism were being swept aside, temples were being cleansed of all undesirable rites and rituals, priesthood purified, and the new monastic orders that were coming into being came to wear a new garb, austere and puritanic. Indeed, by about the thirteenth and fourteenth centuries the South came to be regarded as the home of purer forms of Brahminical Hinduism, and saints and religious leaders of the North started looking towards this region for inspiration and guidance. Chaitanyaadeva of Bengal in the sixteenth century was not certainly the only person to do so. History records that almost all the major reformist movements and protestant leaders of mediaeval India, within the fold of Brahminical Hinduism, came from eastern India and western Deccan. The priests of the South and western Deccan were actually considered to be purer and more knowledgeable about the tenets and rituals as well as about the laws and customs regulating the Hindu social order.

It was perhaps this background of Indian socio-religious life of the times that prompted Yakshamalla and Jayasthimalla to turn to the South for purifying the Pasupatinatha temple and regulating anew the contemporary social order of Nepal. While the attempt of Yakshamalla seems to have succeeded in so far as even today the temple of Pasupatinatha stands away and apart from the main stream of socio-religious life of the country, its priests and protectors are southern Bhattacharya Brahmins even to this day, and the rituals connected with the worship of the deity are simpler and purer, the attempt of Jayasthimalla does not seem to have had any but marginal effects in the long run.

## V

We have just said that the Pasupatinatha temple with its Bhattacharya Brahmin priests and simpler and purer form of ritualistic worship stands away and aloof from the main

stream of the socio-religious life of the community. But what does it mean actually from the point of view of Nepalese life and society as they manifested themselves in the domain of religion?

From what has been said above it is clear that the temple does not and cannot have any very potent social function. Its priests live a life of their own ; they have indeed no social relationship with the local people. Secondly, though the temple is visited by a large number of people who come to offer their worship the worshippers have no sense of participation in the act of worship. Ordinarily, the rituals of worship in Brahminical Tantric Hinduism in Nepal, as in India, as well as in Vajrayana Buddhism, amounts to propitiating the gods, goddesses and spirits with offerings of flowers and fruits, sandal-paste, rice or some other corn, *panchamrita* or a nectar-mixture of milk, curd, honey, sugar and *ghee* or clarified butter, incense and light (*dhupa* and *dipa*). Sacrifice of animals may also be one of the items, and fermented liquor another, depending upon whether the devotee is an adherent of one of the Tantric cults or not. But the *puja-vidhi* of Pasupatinatha is altogether different. Here no offering except flowers is admissible, along with *dhupa* and *dipa*, and within the temple area no special ritual is allowed. Meat, fermented liquor, eggs etc., which are favourite and almost indispensable offerings of the Newars in other Saiva and Sakta temples, are strictly forbidden at the Pasupatinatha temple where the ritualistic worship starts with the utterance by the priest of Vedic incantations, a thing which is very unusual in any other temple of Nepal. This temple, by thus prohibiting the popular rituals of worship, has also kept out the people whom it is meant to nourish and sustain.

One final point of consideration. Pasupati is recognized in mythology, art and iconography as an aspect or form of Siva, perhaps his earliest form, archaeologically speaking. In the Pasupatinatha temple this deity is represented in the form of a *Mukha-lingam*, a sophisticated later iconic development of what was originally a fertility symbol. In India, or even elsewhere in Nepal in any Saivite temple where there is a

*Lingam* installed in the sanctum, the representation and worship of the Devi in any or more of her manifestations, is not only permissible, but positively welcome. In most such temples the Devi is an associate divinity, for Siva, in his *Linga* form, cannot be, understandably enough, disunited from her. But not so here in the Pasupatinatha temple where even her worship is prohibited. Indeed, neither in the rituals nor in the invocations is there any indication or suggestion even of the fertility significance of the *Lingam*, and hence no trace of rituals of primitive or tribal origin and association. The Pasupatinatha temple stands in the *deopatan* (*devapattan*) area. In the same area stands another, almost equally important temple, that of the Guhyesvari where one can easily see how rituals of primitive and tribal origin and association were creatively synthesized with the conceptions and forms of Brahminical deities and with the rituals of their worship. Indeed, the deities and the rituals of worship in any temple in Nepal, Buddhist or Brahminical, are evidences of this synthesis. The Pasupatinatha temple is perhaps the one and only exception.

The occasion of *Sivaratri* is a very special one at the Pasupatinatha temple. A festival is held on that occasion every year, and it draws thousands of people, indeed the biggest crowd that ever assembles in any Nepalese temple. But even a casual observer cannot fail to notice that a very large section of this crowd consists of pilgrims from India and the *terai* region of Nepal, and the indigenous people of Nepal, especially the Newars, extend but a very cold recognition and reception to this ceremony. The only part of the ceremony in which there is some joyous participation by them is the big bonfire at the cross-roads, marking perhaps the end of the bitterly cold days of winter. But ordinarily speaking this should not have been the case, since to the average Nepali *Sivaratri* is an auspicious occasion, especially for the womenfolk who want to propitiate the god Siva by fasting for the day and worshipping him at night with a view to seeking his boon for their husbands and children, and an average Newari is usually very prone to such ideas. But

the fact remains that the Newars do not seem to attach much importance to this festival. The sections of the people who do so and participate in it fully are the caste-Hindus who at one time or other in the long history of the country, seem to have come into Nepal from India.

#### NOTES

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3. Gnoli, R. op. cit. Nos. XXXV-XXXIX ; XLI-XLIV.
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# A NOTE ON THE SOCIOLOGY OF BUDDHIST TANTRISM

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**Abstract:** This is an experiment to solve problems faced by a Buddhologist by resorting to sociological analysis. In this analysis, two technical difficulties emerge : (i) The source material will be mainly collected from extant Buddhist Tantric literature as Buddhist Tantrism is no longer a living force. Can the sociological techniques which are primarily based on observation of existing societies be applicable to societies of the past ? (ii) The establishment of a technique which treats Tantrism as a comprehensive system. That in itself is a big task.

## Preliminary Remarks

IT remains a controversial issue as to who would be more fit to undertake the type of work proposed to be done here—a sociologist or a Buddhologist. Both specialists suffer from certain handicaps.

While trying to understand Tantrism, I have come across a number of problems which either for lack of enough material have been left unsolved or in cases where some solutions have been offered, they were found unsatisfactory and inadequate. The proposed project will attempt to solve some of these problems by resorting to a method in which sociological analysis will be correlated to the historical accounts of the period and the recent findings of archaeological excavations carried on in areas like the Swat Valley in Pakistan where Buddhist Tantrism flourished in ancient days.

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### *Tantric Sources*

As far as the Tantric sources are concerned the material will be collected from the extant Tantric literature in Sanskrit and in Tibetan translations of Sanskrit works, or works written in Tibetan on India.

- (i) Tantras : their theory and practice.
- (ii) The accounts of the lives of the Tantric saints or *siddhas*, of which at least three versions are available in the *bsTan-hgyur*. The published version of Taranath's work could also be used.
- (iii) Histories of Buddhism in India and Tibet written by Indian and Tibetan writers. In this may be included the historical works of Taranath, Buxton, Sum-pa-mkhan-po, gSon-nu-dpal, Kun-dgah-rdo-rje, and others.
- (iv) Records like *pothis* and *bahis* kept at the various Tantric shrines.

These materials could be supplemented by other relevant materials.

### *Scope of the Note*

The purpose of this short note is to test certain ideas about possible sociological analysis and as such no final formulation of questions is attempted. So also the data for analysis has been selected and limited. Only some salient features of Buddhist Tantrism and certain questions as to the picture of society in which the Tantrics functioned are discussed.

Though scholars have accepted two varieties of Tantrism, namely, Buddhist and Hindu, no satisfactory attempt has been made to define the exact nature of Tantrism, the place, time and causes of its origination and the causes of its assimilation by Buddhism and Hinduism. Here I shall confine myself to the discussion of the salient features which characterize Buddhist Tantrism.

## *Salient Features of Buddhist Tantrism and their Sociological Analysis*

The salient feature of Buddhist Tantrism seems to be the use of sense-experience as a means towards the attainment of Nirvana. The Tantric practician is told again and again not to undergo any hardship nor to curb his desires in order to attain Nirvana. Nirvana can be attained through the fulfilment of the five senses. This is directly opposed to the doctrines of other religious systems which have always considered sense-experience as a hindrance to spiritual experience. Could this be called a case of ideological opposition ?

This sense-experience is sought through material fulfilment of different kinds : for example, the consumption of wine and five kinds of meat is advocated. Music and dance are not eschewed. Intimate company of women is given supreme place. Not only this, but the free expression of emotions and their transference into action is emphasized. All these observances are in complete opposition to those of certain other religious sects, including early Buddhism.

A detailed investigation of the social status of the practician and his relationship with women will bring to light the following facts. As far as the former is concerned, it may be said that many of the *siddhas* came from royal families but also there were many others coming from Brahmin and Kshatriya families. The occupational castes of some are also mentioned. But curiously enough in the Tantras themselves, the caste or social status of the practician is not mentioned, which may mean that by establishing relations with the Tantric, the individual really broke away from all social hierarchy and ties and that is perhaps the reason why the mention of social status was not thought relevant. Now to consider the latter, i.e. his relationship with women : It is often said that he should contemplate in the company of *brahmani*, *rajahi* (washer-woman), a *dombi* (a low-caste woman), *candali*, *antyaja* (women of lower castes) or tribal women like a *kinnari*, a *yaksi* or *asuri*. In fact, in general, woman's company should be sought. Conceptually the reason that is given is that women

are the embodiment of Prajnaparamita. Taking this in its literal sense, ordinarily the ways adopted to express the reverence felt for the embodiment of Prajnaparamita would be exactly the opposite of those adopted by the Tantrics. Looking at this in the social context, two explanations are possible.

(1) Does it point to the fact that perhaps Tantrism was a religion of the lower strata of society, especially lower-class women being the carriers of the cultic practices which were later adopted by the higher classes ? (Not infrequently does one hear about the king or prince being initiated by the brandy-selling woman or swine-keeping woman.) This could be one kind of movement, i.e. from the lower to the upper. In the observance of certain rituals, especially the initiation (*abhiseka*) which was supposed to be originally the coronation ceremony (*cakravartyabhiseka*) performed at the time of assuming royal power, one can perceive the movement from the upper to the lower. Could this point to real social intercourse and interchange between various strata of society at the time when Buddhism assimilated Tantrism into its fold ?

(2) Assuming that a society with rigid caste system would forbid relations with women outside the caste, the Tantrics ran counter to this by asking the followers to have relations with women irrespective of social status or caste. Thus the Tantric code of conduct runs opposite the usual social norm. Another relevant feature that may be mentioned in this connexion is that the practitioner is always urged to contemplate in close company of mother, daughter, sister and niece, so that he should attain *siddhi* quickly. Once again in the normal social code, these are exactly the female relatives with whom it is immoral to have sexual relations. The norm of behaviour of the practitioner as a member of a religious group is opposed to the norm of behaviour socially prescribed. Also this deprives the woman of all social and familial status in the context of the Tantric group. She stands there in his eyes as an object, at once above the society (as an embodiment of Prajnaparamita) as well as out of the society. She is a non-social entity used as an instrument.

From this analysis it follows that the Tantrics, on the one

hand, opposed ideologically the pattern of religious life by introducing the sensual experience as a means of attainment of Nirvana and, on the other hand, as far as the social norm of behaviour was concerned, they freed themselves from all moral obligations by considering woman as a non-social entity. It remains to be seen what kind of society would give rise to and tolerate the existence within itself of such groups.

Another problem that poses itself is in connexion with the functional levels of the Tantric practician. Did he function on two different levels, namely, the level of the Tantric group and the level of the society? Could he be a member of both without any disharmony? In the lives of the *siddhas*, there are instances of a *siddha* being persecuted by the king who found him in the embrace of a 'low-caste' woman. But after the persecution, the king relents because of the supernatural powers of the *siddha*. In other words, society still expected adherence to its norms of behaviour from the *siddhas* and ordinary citizens alike, although an exception was made in the case of the *siddhas* by the recognition of their supernatural powers. In this connexion, attention may be drawn to a modern document, namely, the Kinsey Report on the sexual behaviour of the adult American male. There, a member of a civilized community can and does satisfy his *abnormal sexual* urge in a way which he screens off from public gaze, while outwardly he conforms to the behaviour-pattern approved by society. In other words, he functions both as a normal citizen and as an individual with certain urges. In the case of the Tantrics, their normal sexual behaviour itself was institutionalized, but what was institutionalized was different from that followed and approved by society at large.

Looking at the historical development of Buddhism, it remains to be seen why an intellectual religion of the higher classes like Buddhism allowed in its fold religious practices predominantly ritualistic, emotional and probably a product of the lower strata of society. The assimilation of the rituals, various ways of worship and use of sense-experience as a means of gaining spiritual experience changed the character of Buddhism completely. The originally monastic, intellectual and aristocratic

cractic religious system suddenly opened itself to the masses. The answer of this change must lie in social change. Or was it an attempt to come to terms with Hinduism while maintaining its identity? Did this contribute towards its disappearance from India? Also, could it be said that Tantrism was an answer to a problem faced by a society which could neither forego the fulfilment of the senses nor help being preoccupied with the spiritual quest?

The Tantric practices are primarily meant to transform the individual practician and as such have psychological implications. As the preoccupation of the sociologist is to establish patterns of relations between individual and the group, the philosophical basis and psychological implications or consequences of these practices are practically left out of consideration. It might amount to treating Tantrism as a bundle of esoteric practices, which it is not. It is a whole system of thought and has to be treated as such. This can be done only by correlating the philosophical, psychological and sociological factors into a composite whole.

These are some indications of the interaction of society at large and Tantric ideology and behaviour as its outcome in the past. As far as Indian society is concerned, Buddhist Tantrism has long ceased to be a living force directly. But many practices of Tantric origin still have a meaning for Indians. In the northern border regions of India and in Nepal, Bhutan and Sikkim, it is still a living faith. It would be interesting to see how Tantrism has affected these societies. For example, in Nepal, where Tantrism is still practised extensively, there is a separate caste of Vajracaryas known as *Banjras*.

It would also be interesting to consider the implications of the youth movements in U. S. A. like hippies, yippies or the widespread practices like those of wife-swapping. The point here is whether these and such movements could carry in them the germs of Tantric practices. The striking difference between these movements and Tantrism is the absence of a transcendental spiritual goal in the former.

# GENETICS OF MEDULLARY STRUCTURE OF HUMAN HEAD HAIR

A. R. BANERJEE

ASITBARAN DAS-CHOUDHURY

(Received on 30 August 1968)

**Abstract.** In an attempt to find out the genetic significance of medullation of human head hair, samples of 25 pairs of German twins comprising both monozygotic (EZ) and dizygotic (ZZ and PZ) twins were studied. Strong genetic component of variability was found to be responsible for the manifestation of medullary character of human head hair.

**M**ORPHOLOGICAL characteristics of human head hair as one of the criteria for racial study has long been recognized. But apart from it, human head hair is said to have certain histological peculiarities which are frequently used in personal identification. Hausman (1934), Kirk (1940), Trotter and Duggins (1950) and Banerjee (1963) attempted to evaluate the nature and significance of the above characters for that purpose.

Browne (1853) classified the various races of mankind into groups according to the cross-section of the hair shaft. This view was later on extended by Pruner-Bey (1883) who attempted a correlation of hair form with cross-section and medullation of the shaft. The validity of cross-section is now open to question since Hausman (1934), Steggerda (1940), Keneberg (1935), Seibert and Steggerda (1942), Trotter and Duggins (1948), Schaeuble (1958) and Vernall (1961) have shown the existence of high variabilities in the measurable characters of the cross-section. Interest has, therefore, been extended to other histological characters of the shaft such as diameter, medullation and pigmentation.

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Of the histological characters of human head hair medulla received the foremost importance and its study has largely been undertaken by American authors. Much of it is due to Hausman (1924-25) and Wynkoop (1929) for their initial classification of medulla.

The relationship between medulla and diameter of hair shaft was studied firstly by Oesterlene (1874) and later on confirmed by Hausman (1924-25) and Wynkoop (1929). Wynkoop (1929) and Hausman (1930) noted that the presence or absence of medulla as well as its type is in direct agreement with the diameter of the hair shaft. Hair shaft with largest diameter possesses continuous medulla frequently. But Duggins and Trotter (1950) failed to obtain any correlation between the occurrence of various medullary types and diameter and also with the age. Banerjee (1963) noted the individual variation in the occurrence of different medullary types and hair diameter. Association of the medullary types with different hair forms was studied by Banerjee (1957, 1959, and 1965) where frizzly and woolly hair showed the highest incidence of absence of medulla while the straight hair showed the highest incidence of continuous medulla.

Medullary structures thus appear to have been studied mainly with respect to age, diameter and hair form. It appears from the above that the hereditary significance of medullation as well as other microscopical characters of human head hair has yet to be known. How far the medullary structures and other microscopical structures of hair shaft are controlled by the genetic component of variability and how far by the non-genetic ones has yet to be thoroughly investigated.

With this end in view an attempt has been made to find the role of the genetic and the non-genetic component of variability in the manifestation of medullation, hair diameter, hair length and other histological characteristics of hair shaft. The result of investigation on the genetic significance of medulla has been reported in the present communication. The findings of other investigations will be communicated subsequently.

### *Material and Method*

Material for the present study consisted of the hair samples from 25 pairs of German twins comprising the monozygotic (EZ), the same-sexed dizygotic (ZZ) and the different-sexed dizygotic (PZ) twin pairs. All the samples were collected by one of us (A. R. B.) in the Institute for Human Genetics, Münster, Germany. The zygosity of the twins was established through the similarity method of diagnosis supported by detailed serological tests (ABO, Rh, MNS, P, Kell, Gc, Gm, HP). All the samples were cut close to the scalp following Pinkus (1927).

Details of the samples studied for the present purpose have been given in the following table.

TABLE 1

*Number of samples according to their sex and zygosity.*

Twins	Sex			Total
	MM	FF	MF	
Monozygotic (EZ)	5	5	—	10
Dizygotic	Same-sexed (ZZ)	5	5	—
	Different-sexed (PZ)	—	—	5
Total	10	10	5	25

Average age of the male and the female twins included in the present study was 12.1 and 13.9 years respectively.

After properly cleaning the samples, 25 strands of hair from each of the individuals were studied in a similar method described earlier (Banerjee 1965). Thus the total number of strands studied in the present investigation was 1250.

The three-fold classification of medulla proposed by Banerjee (1965) was followed.

Percentile occurrence of different types of medulla in each of the individuals of the three categories of twins classified according to their sex has been given in Tables 2, 3 and 4.

TABLE 2

*Percentile occurrence of the different types of medulla among the monozygotic (EZ) twin pairs.*

Twin Nos.	Pair Nos.	Male			Female		
		Medulla			Medulla		
		Absent	Discontinu- ous	Continu- ous	Absent	Discontinu- ous	Continu- ous
1	I	44	56	—	40	60	—
	II	52	48	—	40	60	—
2	I	20	80	—	52	48	—
	II	16	84	—	72	28	—
3	I	28	72	—	8	92	—
	II	60	40	—	20	80	—
4	I	72	28	—	96	4	—
	II	76	24	—	84	16	—
5	I	40	60	—	12	88	—
	II	56	44	—	12	88	—

TABLE 3

*Percentile occurrence of different types of medulla among the dizygotic same-sexed (ZZ) twin pairs.*

Twin Nos.	Pair Nos.	Male			Female		
		Medulla			Medulla		
		Absent	Discontinu- ous	Continu- ous	Absent	Discontinu- ous	Continu- ous
1	I	20	80	—	76	24	—
	II	64	32	4	12	88	—
2	I	64	36	—	64	36	—
	II	96	4	—	20	80	—
3	I	52	48	—	36	64	—
	II	84	16	—	72	28	—
4	I	56	44	—	44	56	—
	II	40	60	—	48	52	—
5	I	52	48	—	20	80	—
	II	32	68	—	64	36	—

TABLE 4

*Percentile occurrence of the different types of medulla among the dizygotic different-sexed (PZ) twin pairs.*

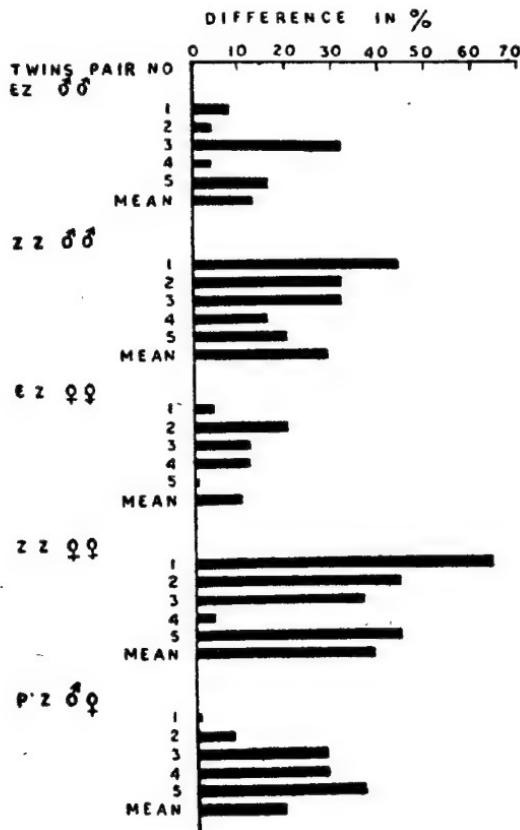
Twin Nos.	Pair Nos.	Sex	Absent	Medulla	
				Discontinuous	Continuous
1	I	M	72	28	—
	II	F	72	28	—
2	I	F	8	76	16
	II	M	16	84	—
3	I	F	100	—	—
	II	M	72	28	—
4	I	M	8	92	—
	II	F	36	64	—
5	I	F	4	96	—
	II	M	86	64	—

It will be seen from the tables above that the incidence of medulla among the partners of the monozygotic (EZ) twins does not differ much from one another. Among both the sexes of the monozygotic (EZ) twins the difference in the occurrence of the different types of medulla between the two partners appears to be smaller than those of their dizygotic same-sexed (ZZ) and different-sexed (PZ) counterparts.

The intra-pair differences in the percentile occurrence of the medulla among both sexes of the three categories of the twins (EZ, ZZ and PZ) have been presented in Figure I.

It will be seen therefrom that the monozygotic (EZ) twins show the least differences compared to those of the dizygotic same-sexed (ZZ) and different-sexed (PZ) ones.

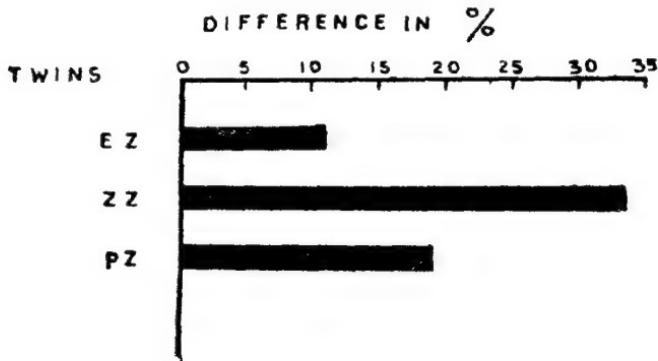
**INTRA-PAIR DIFFERENCES IN PERCENTILE OCCURRENCE  
OF THE MEDULLA.**



**FIG-I**

The mean intra-pair difference in the percentile occurrence of medulla has also been calculated on the basis of zygosity for each category of twins (EZ, ZZ and PZ) and has been presented in Figure II.

## THE MEAN INTRA-PAIR DIFFERENCE IN PERCENTILE OCCURRENCE OF MEDULLA



**FIG-II**

It will be evident from that figure that mean intra-pair difference in medullation among the monozygotic (EZ) twins is found to be the least (11.20%) compared to those of the dizygotic same-sexed (ZZ) (33.60%) and different-sexed (PZ) (19.20%) ones.

### *Discussion*

Von Verschuer (1939) observed that the objective of twin analysis is to find out the interaction of heredity and environment with regard to the complex and quantitative inheritance in man. The presence of genetic component of variability is generally ascertained by comparison of the average of the differences between the two members of the monozygotic twin pairs to the average of the differences between

the two members of the dizygotic twin pairs. This comparison has been done in the present study on the basis of the mean intra-pair variances (Osborne *et al.* 1958 and 1962) of the medullary ratio.\* The mean intra-pair variances of medullary ratio of monozygotic (EZ) and dizygotic (ZZ) twin pairs were calculated and these variances were compared by using the 'F' tests.

\* Medullary ratio was calculated as follows: Medullary ratio =  $M/n$ , where M is equal to total number of medullated hair and n is the total number of strands studied. Thus the value of medullary ratio is bounded by 0 and 1.

TABLE 5

*Mean intra-pair variances of the medullary ratio.*

Zygosity	Sex	No. of twin pairs	Variance	F ratio	P
EZ	M	5	.013	3.38	<.20
ZZ	M	5	.046		
EZ	F	5	.006	15.83	<.05
ZZ	F	5	.092		
EZ*		10	.010	6.90	<.01
ZZ*		10	.089		

\* Male and female combined.

It will be noted from the above table that variance ratio for the male is smaller than that of the female and fails to reach the 5% significance level. But when males and females

are treated together on the basis of their zygosity the variance ratio is found to be significant both at 5% and 1% level which is suggestive of the presence of a strong genetic component of variability for the incidence of the medullary character in the hair shaft.

Heritability of the medullary structure has been estimated by using Holzinger's formula (1937) modified by Neel and Schull (1954), Clark (1956) and Vogel (1961). It has been seen from the above estimate that among the male twins 71%, while among the female twins 93% of the hereditary factors are responsible for the incidence of the medullary structures. The sexual variation in the hereditary estimate might be due to interplay of certain non-genetical factors which is difficult to explain unless further work is done in this line. When all the twins irrespective of their sexes are classified according to their zygosity and considered for the heritability estimate, 85% of the hereditary component of variability has been found to be responsible for the incidence of medullation.

Further work with much more data is, however, necessary to find out the validity of the above-mentioned contention since Kempthorne *et al.* (1961), have cast serious doubts on the meaning and reliability of heritability estimates calculated from twin data by Holzinger's formula.

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# ANTHROPOMETRIC CHARACTERS OF FOOT OF A RURAL AND AN URBAN POPULATION OF ASSAM

BONOSHREE DEVI

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( Received on 10 May 1968 )

**Abstract :** The present article deals with the differences between a rural and an urban population of Assam in respect of some anthropometric characters of the foot. The present data have been compared with the data reported from Bengal.

## *Introduction*

THE difference between the urban and rural populations of Bengal in respect of some morphological characters of foot was pointed out by Sarkar (1958). The present study, in some respects, may be considered as a follow-up of his work. Anthropometric characters of a rural and an urban population of Assam have been studied with a view to finding out if there are differences between the two populations. The results obtained in the present study have been compared with those reported by Sarkar.

The following anthropometric characters have been dealt with : foot length, foot breadth, foot height, foot girth and hallux divergence angle. The foot index has also been calculated. Foot height and foot girth were measured directly on the subjects, while length, breadth and angle were measured on the tracings of the foot. In taking the contour of the foot, the method described by Sarkar was adopted. For the purpose of comparison the *t*-test of significance has been applied. The value of 2 has been taken as the standard of significance.

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The urban data were collected in Gauhati, mostly from among those University students who come from urban areas. The rural sample was collected from two villages, namely, Sensoa and Khutikotia in Nowgong district. The data were collected at random. Only adult persons were studied. The subjects were mostly unrelated persons. The subjects included in the study come from four Assamese castes, namely, Brahmin, Kalita, Keot and Koch. The sample size was 100 for each sex of the two populations. Thus the total number was 400 including 200 urban (100 male and 100 female) and 200 rural (100 male and 100 female) individuals. The urban individuals habitually used footwear, while the rural people did not use footwear.

### *The Data*

The statistical constants of the anthropometric characters have been given in Table 1. Table 2 shows the values of  $t$ .

**Male :** It appears from Table 1 that the foot of the rural male is longer and broader than that of the urban male. The length of foot of urban male varies between 21.6 cm. and 26.5 cm., with the mean of  $24.56 \pm .051$  cm. while that of the rural male varies between 22.2 cm. and 27.7 cm. with the mean  $25.17 \pm .063$  cm. The difference (0.61 cm.) is statistically significant, the value of  $t$  being 7.6. In respect of foot breadth also the two populations differ significantly as the value of  $t$  is 4.2. The mean foot breadth of the urban male is  $9.29 \pm .05$  cm. with the range varying between 6.8 cm. and 10.3 cm., while that of the rural male is  $10.36 \pm .05$  cm., the range varying between 8.7 cm. and 11.8 cm.

TABLE I  
*Statistical Constants of the Measurements.*

No. of individuals	Male (Urban)				Male (Rural)			
	Range	Mean±S.E.	S.D.±S.E.	Range	Mean±S.E.	S.D.±S.E.	Range	
Foot length (cm.)	21.6-26.5	24.56±.051	.522±.03	22.2-27.7	25.17±.063	.663±.04		
Foot breadth (cm.)	6.8-10.3	9.29±.05	.53±.05	8.7-11.8	10.36±.05	.59±.04		
Foot index	33.0-45.9	38.72±1.46	1.48±.12	35.9-44.9	40.37±.18	1.83±.12		
Foot height (cm.)	6.0-8.1	7.12±.048	.48±.02	6.4-9.0	8.33±.078	.78±.05		
Foot girth (cm.)	21.0-25.1	23.23±.071	.71±.05	21.0-27.1	23.21±.074	.74±.05		
Hallux Divergence angle	5°-8°	6.64±.72	.72±.05	4°-10°	7.55±.12	1.29±.09		
Female (Urban)				Female (Rural)				
Foot length (cm.)	21.0-25.1	23.20±.085	.85±.06	20.5-25.5	22.87±.088	.88±.06		
Foot breadth (cm.)	7.6-9.8	8.73±.049	.49±.03	7.7-10.2	9.07±.046	.42±.03		
Foot index	34.0-42.9	38.62±.22	.22±.15	36.0-43.9	39.15±.22	2.26±.03		
Foot height (cm.)	5.6-8.0	6.73±.06	.605±.04	5.5-7.6	6.38±.04	.47±.03		
Foot girth (cm.)	19.8-24.0	21.53±.08	.89±.07	18.3-23.8	21.24±.08	.803±.05		
Hallux Divergence Angle	4°-10°	6.29±.10	1.11±.07	4°-8°	6.16±.11	1.16±.08		

TABLE 2  
*Difference of Means : Values of t-test.*

	Foot length		Foot breadth		Foot index		Foot girth		Foot height	
	Diff.	t	Diff.	t	Diff.	t	Diff.	t	Diff.	t
Male : Urban-Rural	0.61	7.6	1.07	4.2	1.65	2.3	0.02	2.2	0.21	2.3
Female : Urban-Rural	0.33	3.0	0.34	6.8	0.53	2.4	0.29	2.6	0.35	4.8

The mean length-breadth index of foot is  $38.72 \pm .146$  for the urban male and  $40.37 \pm .18$  for the rural male. The difference (1.65) between the two is significant as is revealed by the value of  $t$  (2.3).

In respect of height also the two populations, namely, the rural and the urban, differ from one another, the value of  $t$  being 2.3. The mean value of the rural male ( $7.33 \pm .078$  cm.) is higher than that of the urban male ( $7.12 \pm .048$  cm.).

The two populations, however, agree in respect of girth of foot. The mean foot girth of the urban male is  $23.23 \pm .071$  cm., with the range varying between 21.0 cm. and 25.1 cm., while that of the rural male is  $23.21 \pm .074$  cm., the range of variation being from 21.0 cm. to 27.1 cm. The difference .02 cm. is not statistically significant.

The mean foot angle is  $6.54^\circ \pm .72$  and  $7.55^\circ \pm .12$  for the urban male and rural male respectively.

Thus it appears that the foot of the urban male differs from that of the rural male in respect of (a) foot length, (b) foot breadth, (c) foot index and (d) foot height. The rural male has in general larger foot than the urban male.

**Female:** The urban female has longer and narrower foot than the rural female. The height of foot is less in the former than in the latter.

The foot of urban female in average is  $23.20 \pm .085$  cm. in length and it varies between 21.0 cm. and 25.1 cm., while that of the rural female is  $22.87 \pm .088$  cm., the range varying between 20.5 cm. and 25.5 cm. The difference of 0.33 is statistically significant ( $t = 3.0$ ).

The mean breadth of foot is  $8.73 \pm .049$  cm. in the urban female and  $9.07 \pm .046$  cm. in the rural female. In the former the breadth varies between 7.6 cm. and 9.8 cm. and in the latter between 7.7 cm. and 10.2 cm. The difference (0.34) is statistically significant, the value of  $t$  being 6.8.

The mean length-breadth index of foot is  $38.62 \pm .22$  and  $39.15 \pm .22$  in the urban and the rural female respectively. In the former it varies between 34.0 and 42.9, while in the latter between 35.0 and 43.9. The value of  $t$  (2.4) suggests statistically significant difference.

TABLE 3  
*Comparison of 'Mean'.*

No. of individuals	Foot length Mean±S. E. (in cm.)	Foot breadth Mean±S. E. (in cm.)	Foot index Mean±S. E.	Hallux Divergence Angle Mean±S. E.	Author
Assam Male Urban	24.56±.05	9.29±.05	38.78±.146	6.54°±.72	Present study
Assam Male Rural	25.17±.063	10.36±.05	40.37±.18	7.55°±.12	do.
Bengal Male Urban	25.33±.073	9.85±.03	39.73±.20	6.48°±.130	Sarkar
Bengal Male Rural	24.62±.101	9.47±.05	39.00±.11	6.42°±.20	do.
Assam Female Urban	23.20±.085	8.78±.049	38.62±.22	6.28°±.10	Present study
Assam Female Rural	22.87±.088	9.07±.046	39.15±.22	6.16°±.11	do.
Bengal Female Urban	22.64±.108	8.71±.066	38.57±.23	6.70°±.25	Sarkar
Bengal Female Rural	22.88±.12	8.66±.056	38.39±.32	5.60°±.24	do.

The mean height of foot of the urban female ( $6.73 \pm .06$  cm.) is greater than that of the rural female ( $6.38 \pm .04$  cm.). The difference (0.35) between the two is statistically significant ( $t=4.8$ ). The height varies between 5.6 cm. and 8.0 cm. and between 5.5 cm. and 7.6 cm. in the urban and rural female respectively.

The difference ( $0.13^\circ$ ) between the angle of the urban female ( $6.29^\circ$ ) and that of the rural female ( $6.16^\circ$ ) does not appear to be significant.

The mean girth of foot is  $21.53 \pm .08$  cm. and  $21.24 \pm .08$  cm., in the urban and the rural female respectively. The difference of 0.29 cm. is significant, the value of  $t$  being 2.6.

Thus it appears that, as in the case of males, the females of the two populations, namely, rural and urban, also differ in respect of (a) foot length, (b) foot breadth, (c) foot index and (d) foot height.

### *Discussion*

The present data have been compared with the Bengal data in Table 3. It appears that, in respect of the anthropometric characters there are rural urban variations. The present study reveals that in general the rural males have longer and broader feet than the urban males. But the Bengal urban males have feet of bigger size than the rural males. The urban females of the Assam sample have longer and narrower feet than the rural females. But in Bengal the rural females show a slightly greater length and lesser breadth than do the urban ; though the differences are not significant.

### *Summary*

The foot of an urban sample of Assam has been compared with that of a rural sample in respect of some anthropometric characters, namely, length, breadth, girth, height, index and hallux divergence angle. The study reveals rural-urban

variation in respect these characters. The rural males have longer and broader feet than the urban males. The height and angle are also greater. The index is also higher. In respect of girth, however, the two samples agree. On the other hand the rural females have shorter and broader feet than the urban females. The height and girth are greater in the urban than in the rural samples.

The results obtained in the present study have been compared with that reported from Bengal by Sarkar.

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# ANTHROPOMETRY OF THE KAIBARTA OF ASSAM

BHUBAN M. DAS

MADHU SUDAN DAS

(Received on 24 January 1968)

**Abstract.** Anthropometric measurements of 100 adult males and 77 adult females of the Kaibarta, a caste group of Assam, were collected from different parts of the district of Kamrup. The data have been analysed and each character has been described separately, showing the sex differences.

## *Introduction*

THE Kaibarta form a boating and fishing community in Assam. They are scattered throughout the plains districts of Assam. But their main concentration is found in the districts of Kamrup and Nowgong. In recent years, some Kaibarta have taken to agriculture and industries. They are Hindu.

As regard the previous study on the physical characters of the Kaibarta, our knowledge is very much limited. Dutta (1938) first attempted to make a comparative study of the anthropometric characters of the castes of Assam. In that connexion he took a few important measurements on one Kaibarta male.

The present anthropometric investigation was carried out in the months of October and November 1966. The data were collected by the second author from five different places in Kamrup district, Assam, viz., Soalkuchi, an industrial village,

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20 miles north-west of Gauhati ; Khidirpukhuri, 29 miles west of Gauhati ; Rajapukhuri, 3 miles east from the above site ; Padumbari, a small locality situated at a distance of about 7 miles south-west of Gauhati, and Malaibari, near Kamrup. Khetri railway station.

The number of individuals measured is 100 adult males and 77 adult females. The mean value of age is  $36.65 \pm 3.40$  years in case of males and  $34.50 \pm 1.11$  years in case of females.

The following measurements were taken : stature, sitting height, head length, head height, head breadth, minimum frontal diameter, bignonial breadth, bizygomatic breadth, nasal height, nasal breadth, upper facial height and total facial height. The following indices have been calculated : cephalic, length height, breadth height, upper facial, total facial and nasal.

The measurements were taken according to the method prescribed by Wilder. In analysing the measurements and indices Martin's classification have been followed.

### Somatometric Characters

TABLE I

*Stature*

Class	Range in cm.		Male %	Female %
Pygmy	—	129.9	—	1.3
Very short	130.0	149.9	2	65.0
Short	150.0	159.9	45	33.7
Below medium	160.0	163.9	23	—
Medium	164.0	166.9	17	—
Above medium	167.0	169.9	6	—
Tall	170.0	179.9	7	—

The mean stature of the male is  $160.93 \pm .64$  cm. with the range varying between 146.2 cm. and 174.7 cm. while that of the female is  $147.91 \pm .61$  cm. with the range varying between 126.2 cm. and 159.8 cm. The male members of the

Kaibarta are short statured in the majority (45%). The frequencies of below medium, medium, above medium and tall are 23%, 17%, 6% and 7% respectively.

A pygmy element is found among the females. They are very short (65%) in stature. The frequencies of short and pygmy are 33.7% and 1.3% respectively.

Thus the differences between the members of the two sexes in respect of stature is marked.

TABLE 2  
*Cephalic index*

Class	Range	Male %	Female %
Dolichocephalic	70.0 - 75.9	18	13.0
Mesocephalic	76.0 - 80.9	58	65.8
Brachycephalic	81.0 - 85.9	22	26.0
Hyperbrachycephalic	86.0 -	2	5.2

Both male and female Kaibarta show mesocephaly in the majority (male 58% and female 55.8%). The percentage of brachycephaly is 22 in male and 26 in female. Hyperbrachycephalic head occurs in 2% and 5.2% in male and female respectively. Dolichocephalic head is found to be 18% in male and 13% in female. The mean cephalic index of male Kaibarta is  $78.84 \pm .30$  with the range varying between 77.2 and 86.2. The mean head length is  $18.49 \pm .05$  cm. with the range varying between 17.1 cm. and 19.8 cm. and the mean head breadth is  $14.60 \pm .05$  cm. with the range varying between 13.4 cm. and 16.1 cm.

In female, the mean cephalic index is  $79.44 \pm .39$  with the maximum of 88.4 and the minimum of 70.0. The mean head length is  $17.20 \pm .04$  cm. with the range varying between 16.1 cm. and 18.8 cm.; the mean head breadth is 14.04 cm.  $\pm .04$  cm. with the range varying between 12.2 cm. and 15.1 cm.

Thus in respect of cephalic index the males agree with the females. The difference between the mean of the two sexes is 0.60 only.

TABLE 3

*Length height index*

Class	Range	Male %	Female %
Chamaecephal	—	57.6	1
Orthocephal	57.7 — 82.5	12	14.3
Hypsicephal	62.6	—	84.4

Both male and female Kaibarta agree with one another in having predominantly hypsicephalic head in almost equal percentages (87% male and 84.4% female). Orthocephaly is found in 12% in male and 14.3% in female. Chamaecephaly occurs almost in equal percentage in both the sexes, it being 1% in male and 1.3% in female. The mean length height index of male is  $66.46 \pm .33$ , the maximum being 74.5 and the minimum 57.1, whereas in the case of female it is  $66.92 \pm .48$  with the range varying between 53.6 and 82.7.

The mean head height in case of male is  $12.35 \pm .04$  cm. with the range varying between 10.4 cm. and 14.5 cm. and in case of female it is  $12.22 \pm .05$  with the range varying between 10.1 cm. and 13.3 cm.

TABLE 4

*Breadth height index*

Class	Range	Male %	Female %
Tapeinocephal	—	78.9	12
Metriocephal	79.0 — 84.9	36	35.0
Acrocephal	85.0	—	49.4

The two sections, male and female, agree with one another in having predominantly acrocephalic head (52% in male and 49.4% in female). Metriocephaly occurs in almost equal percentages (male 36% and female 35%). Tapeincephaly is found in male and female in 12% and 15.6% respectively.

The mean breadth height index of male is  $83.12 \pm .48$  with the range varying between 68.8 and 96.4 and in case of female it is  $84.34 \pm .51$  with the maximum of 93.5 and the minimum of 72.8.

Thus the difference between the two sexes in respect of breadth height index is not much, being 0.46 only.

TABLE 5  
*Total facial index*

Class	Range	Male %	Female %
Hypereuryprosopic	— 78.0	18	31.2
Euryprosopic	78.0 84.0	30	29.9
Mesoprosopic	84.0 88.0	28	20.8
Leptoprosopic	88.0 93.0	19	11.7
Hyperleptoprosopic	93.0 —	5	6.5

Both the sexes possess euryprosopic face in the majority, its percentage is slightly higher in female (hypereuryprosopic 31.2% and euryprosopic 29.9%) than in males (hypereuryprosopic 18% and euryprosopic 30%). Leptoprosopic face occurs in slightly higher percentage in males (leptoprosopic 19% and hyperleptoprosopic 5%) than in females (leptoprosopic 11.7% and hyperleptoprosopic 6.5%). Mesoprosopic face is seen in 28% and 20.8% in male and female respectively.

The mean total facial index of male is  $84.45 \pm .54$ , the range varying between 68.6 and 100.0. The mean total facial index is  $81.96 \pm .69$  in the case of female, the range varying between 70.1 and 98.3.

The mean bizygomatic breadth of the male is  $13.26 \pm .05$  cm. with the range varying between 11.5 cm and 15.0 cm. whereas in female it is  $12.91 \pm .05$  with the maximum of 13.5 cm. and the minimum of 11.7 cm.

TABLE 6

*Upper facial index*

Class	Range	Male %	Female %
Hypereuryene	— 42.9	—	1.3
Euryene	43.0 — 47.9	26	24.6
Mesene	48.0 — 52.9	55	53.3
Leptene	53.0 — 56.9	16	15.6
Hyperleptene	57.0 —	3	5.2

Mesene type of face is found in the highest frequency both in male and in female, the percentages being 55 and 53.3 respectively. Euryene and leptene occur almost in equal percentages in both the sexes (male : euryene 26% and leptene 16%; and female : euryene 24.6% and leptene 15.6%). Hyper-leptene is found in 3% in male and 5.2% in female, while hyper-euryene is found only in female (1.3%).

The mean upper facial index of male is  $52.70 \pm .30$  which varies between 43.2 and 61.2. In the case of female it is  $50.10 \pm .45$ , the range varying between 39.5 and 63.3. The mean upper facial height of the male is  $6.62 \pm .04$  cm. the range varying between 5.7 cm. and 7.6 cm. whereas the female mean is  $6.34 \pm .05$  cm. with the range varying between 5.3 cm. and 7.7 cm.

Thus the mean value of upper facial index in male is slightly higher than that in female.

TABLE 7

*Nasal index*

Class	Range	Male %	Female %
Leptorrhine	55.0 — 69.9	26	39
Mesorrhine	70.0 — 84.9	60	52
Platyrrhine	85.0 — 99.0	14	9

Mesorrhine nose is found in the highest frequency both in male and in female, the percentages being 60 and 52 respectively. The frequency of leptorrhine is slightly higher in female (39%) than in male (26%). Platyrrhine is 14% and 9% in male and female respectively.

The mean nasal index of the male is  $74.91 \pm .78$  with the maximum of 97.7 and minimum of 61.4. The mean nasal length is  $4.72 \pm .09$  cm. the range varies between 4.3 cm. and 5.8 cm. The mean nasal breadth is  $3.72 \pm .09$  cm. It varies between 3.0 cm. and 4.6 cm. The mean nasal index of female is  $72.88 \pm .85$  with the maximum of 91.6 and the minimum of 55.5. The mean nasal length is  $4.98 \pm .03$  cm. The maximum and the minimum being 5.5 cm. and 3.6 cm. respectively. The mean nasal breadth is  $3.34 \pm .09$  cm. the range varying between 2.8 cm. and 4.0 cm.

Thus the nose of female is slightly narrower than that of male. The difference between the mean of the two sexes is 2.58.

**Minimum frontal breadth:** The mean frontal breadth of male is  $10.72 \pm .05$  cm. the maximum and the minimum being 12.4 cm. and 9.4 cm. respectively. The female mean is  $9.80 \pm .07$  cm. the range varying between 11.3 cm and 9.1 cm,

**Bigonial breadth:** The mean bigonial breadth in male is  $10.55 \pm .06$  cm. The maximum and minimum being 11.2 cm. and 9.0 cm. respectively and that of female is  $9.89 \pm .04$  cm. the range varying between 11.5 cm. and 8.6 cm.

**Sitting height:** The mean sitting height of male is  $82.80 \pm .31$ , the maximum and the minimum being 93.0 cm. and 73.5 cm. respectively, while that of female is  $74.50 \pm .40$  cm. with the range varying between 83.7 cm. and 65.3 cm.

The statistical constants of the measurements and indices with their respective standard errors have been given in Tables 8 and 9.

TABLE 8

(Male 100)

Measurements in cm.	Range	Mean $\pm$ SE	SD $\pm$ SE	CV $\pm$ SE	
Stature	146.2	174.7	160.93 $\pm$ .64	6.41 $\pm$ .45	3.98 $\pm$ .28
Sitting height	73.5	93.0	82.80 $\pm$ .31	3.13 $\pm$ .22	3.56 $\pm$ .25
Head length	17.1	19.8	18.49 $\pm$ .05	0.55 $\pm$ .03	2.97 $\pm$ .21
Head breadth	18.4	16.1	14.60 $\pm$ .05	0.51 $\pm$ .03	3.49 $\pm$ .24
Head height	10.4	14.5	12.35 $\pm$ .04	0.49 $\pm$ .03	3.96 $\pm$ .20
Minimum frontal dia.	9.4	12.2	10.72 $\pm$ .05	0.51 $\pm$ .03	4.75 $\pm$ .38
Bizygomatic breadth	11.5	15.6	13.26 $\pm$ .05	0.56 $\pm$ .03	4.22 $\pm$ .29
Bigonial breadth	9.0	12.2	10.55 $\pm$ .06	0.67 $\pm$ .04	6.35 $\pm$ .44
Upper facial length	5.7	7.6	6.62 $\pm$ .04	0.40 $\pm$ .02	6.04 $\pm$ .42
Total facial length	9.2	12.6	11.11 $\pm$ .06	0.61 $\pm$ .04	5.49 $\pm$ .36
Nasal height	4.3	5.8	4.89 $\pm$ .03	0.33 $\pm$ .02	6.95 $\pm$ .48
Nasal breadth	3.0	4.6	3.72 $\pm$ .09	0.96 $\pm$ .06	25.80 $\pm$ 1.82

*Indices*

Cephalic	72.2	86.3	78.84 $\pm$ .30	3.07 $\pm$ .21	3.89 $\pm$ .26
Length height	57.1	74.5	66.46 $\pm$ .33	3.33 $\pm$ .23	5.01 $\pm$ .35
Breadth height	68.8	96.4	83.12 $\pm$ .48	4.80 $\pm$ .38	5.89 $\pm$ .41
Total facial	68.6	100.0	85.45 $\pm$ .54	5.42 $\pm$ .38	6.23 $\pm$ .44
Upper facial	43.2	61.2	52.70 $\pm$ .32	3.29 $\pm$ .23	6.24 $\pm$ .44
Nasal	61.4	97.7	74.91 $\pm$ .78	7.87 $\pm$ .55	10.50 $\pm$ .74

SD = Standard deviation

CV = Co-efficient of variation

SE = Standard error

TABLE 9

(Female 77)

*Statistical constants of measurements and indices with their respective standard errors*

Measurement in cm.	Range	Mean $\pm$ SE	SD $\pm$ SE	CV $\pm$ SE
Stature	126.2	159.8	147.91 $\pm$ .61	5.39 $\pm$ .43
Sitting height	65.3	83.7	74.50 $\pm$ .40	3.59 $\pm$ .28
Head length	16.1	18.8	17.20 $\pm$ .04	.38 $\pm$ .03
Head breadth	12.5	15.1	14.04 $\pm$ .04	.43 $\pm$ .03
Head height	10.1	13.3	12.22 $\pm$ .05	.50 $\pm$ .04
Minimum frontal dia.	9.1	11.3	9.38 $\pm$ .07	.62 $\pm$ .05
Bizygomatic breadth	11.7	13.5	12.91 $\pm$ .05	.52 $\pm$ .04
Bigonial breadth	8.6	11.5	9.89 $\pm$ .04	.38 $\pm$ .03
Upper facial length	5.3	7.7	6.34 $\pm$ .05	.51 $\pm$ .04
Total facial length	8.9	12.4	11.02 $\pm$ .08	.78 $\pm$ .06
Nasal height	3.6	5.5	4.98 $\pm$ .03	.38 $\pm$ .02
Nasal breadth	2.8	4.0	3.34 $\pm$ .09	.84 $\pm$ .06
<i>Indices</i>				
Cephalic	70.0	88.4	79.44 $\pm$ .39	3.42 $\pm$ .27
Length height	53.6	82.7	66.92 $\pm$ .48	4.29 $\pm$ .34
Breadth height	72.8	93.5	94.34 $\pm$ .51	4.50 $\pm$ .35
Total facial	70.1	98.3	81.96 $\pm$ .69	6.09 $\pm$ .49
Upper facial	39.5	63.3	50.10 $\pm$ .45	3.98 $\pm$ .32
Nasal	56.5	91.6	72.33 $\pm$ .85	7.73 $\pm$ .62

SD = Standard deviation

CV = Co-efficient of variation

SE = Standard error

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# ANTHROPOMETRY OF THE SAHARAYA OF JHANSI, U. P.

MALAY KUMAR BANERJEE

(Received on 22 June 1968)

**Abstract :** The purpose of this study is to present the anthropometric characteristics of the Saharaya, a Scheduled caste inhabiting Jhansi district in Uttar Pradesh.

## *Introduction*

THE Saharaya are a Scheduled caste occupying the lowest place in the social hierarchy. They are primarily landless labourers but also eke out their livelihood by selling honey. The Saharaya inhabit the south-western part of U. P., mostly in Jhansi. Very few are present in Jalaun and Hamirpur districts. In Jhansi, they are found all over the district. Generally they live in agglomerated hamlets. Their population in U. P. is 11,568 according to the 1961 Census.

The anthropometric data on the Saharaya were collected by the present author from the villages of Jaura, Bamrauli and Mirauna during the months of January and February 1967. No attempt has so far been made to study their physical characteristics.

## *The Data*

Anthropometric data on 50 adult male individuals were collected by the author between the ages of 18 and 52 years. The technique of measurement followed is that of Martin, excepting for the auricular height which was measured with Schultz's parallelometer.

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### *Age distribution*

According to 5-year class interval, the distribution of the age of the individuals is as follows :

TABLE 1

#### *Age distribution*

Age	Frequency	Percentage
18 - 22	5	10
23 - 27	17	34
28 - 32	8	16
33 - 37	8	16
38 - 42	1	2
43 - 47	1	2
48 - 52	10	20

Table 1 shows that highest frequencies are observed between 18 years and 37 years ; 76% of the population falling within these ages. The remaining 24% belong to the ages between 38 years and 52 years of which the age group of 48-52 years has the incidence of 20%.

### *Statistical constants*

Table 2 presents mean, standard deviation and coefficient of variation with their respective standard errors for the 13 metric characters of Saharaya males.

TABLE 2

*Statistical constants of direct measurements with their respective standard errors*

Characters (mm.)	Range	Mean $\pm$ S.E.	S. D. $\pm$ S. E.	C. V. $\pm$ S. E.
Stature	1508 - 1736	1624.58 $\pm$ 8.07	57.09 $\pm$ 5.71	3.51 $\pm$ 0.85
Sitting height	748 - 903	830.52 $\pm$ 4.62	32.66 $\pm$ 3.26	3.93 $\pm$ 0.39
Head length	176 - 199	186.98 $\pm$ 0.70	4.98 $\pm$ 0.50	2.66 $\pm$ 0.26
Head breadth	124 - 142	135.08 $\pm$ 0.58	4.18 $\pm$ 0.41	3.06 $\pm$ 0.31
Auricular height	106 - 126	117.64 $\pm$ 0.64	4.54 $\pm$ 0.45	3.86 $\pm$ 0.39
Min. Frontal breadth	89 - 108	98.92 $\pm$ 0.61	4.33 $\pm$ 0.43	4.38 $\pm$ 0.44
Bizygomatic breadth	120 - 142	130.68 $\pm$ 0.59	4.17 $\pm$ 0.42	3.19 $\pm$ 0.32
Bigonal breadth	90 - 115	101.46 $\pm$ 0.72	5.06 $\pm$ 0.51	4.99 $\pm$ 0.50
Upper facial height	60 - 81	68.72 $\pm$ 0.66	4.69 $\pm$ 0.47	6.82 $\pm$ 0.68
Total facial height	101 - 135	114.76 $\pm$ 1.05	7.41 $\pm$ 0.74	6.45 $\pm$ 0.64
Nasal height	41 - 59	48.14 $\pm$ 0.51	3.63 $\pm$ 0.36	7.54 $\pm$ 0.75
Nasal breadth	34 - 42	38.34 $\pm$ 0.03	2.31 $\pm$ 0.23	6.02 $\pm$ 0.60
Hor. Circ. of head	505 - 569	530.10 $\pm$ 0.19	13.38 $\pm$ 1.34	2.52 $\pm$ 0.25

### Stature

Among the Saharaya, 'short' stature is found to occur in the highest frequency (38%). Next to it comes 'below medium' (24%) and 'above medium' (18%). 'Medium' and 'tall' occur in equal percentages of 10. The mean value of stature is  $1624.58 \pm 8.07$  mm. with the range varying between 1736 mm. and 1508 mm. this falling in the 'below medium' class. The classification frequencies of stature are given in Table 3.

TABLE 3

### Stature

Class	Range in mm.	Number	Percentage
Short	1500 - 1599	19	38
Below medium	1600 - 1639	12	24
Medium	1640 - 1669	5	10
Above medium	1670 - 1699	9	18
Tall	1700 - 1799	5	10

### *Sitting height*

Sitting height falls in the following classes :

TABLE 4  
*Sitting height*

Class	Range in mm.	Number	Percentage
Very low	below 749	1	2
Low	750 - 799	8	16
Below medium	800 - 849	29	58
Medium	850 - 899	11	22
Above medium	900 - 949	1	2

It is apparent from Table 4 that the 'below medium' is the most highly represented class, its frequency being 58% ; the next highest concentration is observed in the 'medium' class (22%). Among the Saharaya, sitting height ranges between 748 mm. and 903 mm. and the mean value is  $830.52 \pm 4.62$  mm., which also falls in the 'below medium' class.

### *Cephalic index*

Dolichocephalic element (66%) predominates among the Saharaya. Next to it comes hyperdolichocephaly (30%). The percentage of mesocephaly is 4%. The details are given in Table 5. The mean cephalic index of the group is 72.27.

TABLE 5  
*Cephalic index*

Class	Range	Number	Percentage
Hyperdolichocephal	below 70.9	15	30
Dolichocephal	71.0 - 75.9	33	66
Mesocephal	76.0 - 80.9	2	4

### Nasal index

Though Saharayas are characterized by mesorrhine nose (72%), a high percentage of chamaerrhine (20%) is also met with. Details are given in Table 6. The mean nasal index of the Saharaya under study is 79.99.

TABLE 6

Class	Range	Number	Percentage
Leptorrhine	55.0 - 69.9	3	6
Mesorrhine	70.0 - 84.9	36	72
Chamaerrhine	85.0 - 99.9	10	20
Hyperchamaerrhine	100.0 - above	1	2

### Upper facial index

Though the mesene type of face occurs predominantly (48%), a high percentage of leptine (42%) is also met with. The detailed frequencies are given in Table 7. The mean upper facial index is 52.62.

TABLE 7

### Upper facial index

Class	Range	Number	Percentage
Euryene	43.0 - 47.9	5	10
Mesene	48.0 - 52.9	24	48
Leptene	53.0 - 56.9	14	28
Hyper-leptene	57.0 - above	7	14

### Total facial index

Though in the majority the face of the Saharaya is long as suggested by the highest frequency of leptoprosopic type (46%), yet the frequency of medium type of face is also high, being present in 30% of the sample. The details are presented in Table 8. The mean total facial index of the Saharaya is 87.87.

TABLE 8

*Total facial index*

Class	Range	Number	Percentage
Hypereuryprosop	below - 78.9	3	6
Euryprosop	79.0 - 83.9	9	18
Mesoprosop	84.0 - 87.9	15	30
Leptoprosop	88.0 - 92.9	14	28
Hyperleptoprosop	93.0 - above	9	18

*Summary*

The Saharaya are short to medium in stature, the mean stature being 1624.58 mm. Their head is dolichocephalic (66%). The nose is mesorrhine (72%). The face of the Saharaya is long as revealed by their upper facial and total facial indices.

The author expresses his gratitude to Dr. D. K. Sen, Director, Anthropological Survey of India, for kindly providing him an opportunity to undertake an anthropometric survey of Uttar Pradesh.

# PTC TASTE SENSITIVITY IN SOME ORISSAN CASTES

K. C. TRIPATHY

(Received on 22 November 1967)

**Abstract :** 195 Oriya subjects consisting of 56 Brahmins, 41 Karanas, 49 Khandayats and 49 Other castes have been studied with a view to determining their sensitivity to phenylthiocarbamide. The percentage of tasters among Brahmins is 66.1, Karanas 63.4, Khandayats 81.6 and in the case of Other castes 71.4. The highest taste sensitivity is observed in the case of Khandayats and Other caste groups. Betel-chewing, non-vegetarian diet and smoking have insignificant effect on the taste-threshold distribution and thus do not affect the sensitivity to taste PTC.

## Material

THE present paper deals with the study of the Brahmins, Karanas, Khandayats and Other castes of Orissa like the Oilmen, Barber, Confectioner etc., concerning their ability to taste PTC (phenylthiocarbamide) in relation to eating, chewing and smoking habits. The taste deficiency was examined among 195 Oriya males. The entire data consists of 56 Brahmins, 41 Karanas, 49 Khandayats and 49 Other castes. The subjects tested were between 10 and 25 years of age. The study was undertaken during the year 1965-66 in three major castes. No selection has been applied in choosing the subjects. Attention was paid to keeping the sampling random.

## Method

The sorting method of Harris and Kalmus (1949) and as described by Das (1956) was used to segregate tasters and non-tasters. The PTC solutions (13 concentrations) were prepared

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by the writer. A stock solution containing 0.13% of PTC was made in boiled tap water and then serial dilutions were made to prepare the T. S. N. solution No. 2 to 13. The stock solution was diluted with an equal quantity of boiled tap water to form T. S. N. 13.

After classifying the subject into the taster, non-taster category, his age, caste and drug addiction if any (betel-chewing, tobacco-chewing, smoking, etc.) and dietary habits (vegetarian and non-vegetarian) were also recorded.

TABLE 1

*Distribution of taste blindness in some castes of Orissa*

Groups	No. observed	Absolute numbers		Percentage	
		Taster	Non-taster	Taste	Non-taster
Brahmin	56	37	19	66.1	33.9
Karana	41	26	15	63.4	36.6
Khandayat	49	40	9	81.6	18.4
Other castes	49	35	14	71.4	28.6
Total	195	138	57	70.8	29.2

The incidence of tasters among the different caste groups of Orissa has been presented in Table 1. Out of 195 Oriyas examined, 138 were tasters and 57 were non-tasters; their percentages being 70.8 and 29.2 respectively.

TABLE 2

*PTC taste phenotype and gene-distribution among some castes of Orissa*

Groups	Taster	Non-taster	Genotype	
			T	t
Oriyas number	138	57	0.4959	0.5041
(No.=195) percentage	70.8	29.2		

Homogeneity Chi<sup>2</sup> among the caste groups = 0.882 1 d. f., p > 0.50.

The phenotype and the gene distributions of the different caste groups of Orissa are combined together and have been presented in the Table 2. The homogeneity value among the different caste groups is found to be highly insignificant ( $\text{Chi}^2 = 9.882$ , 1 d. f.;  $p > 0.50$ ). The phenotype numbers, therefore, were combined together and the gene frequencies  $T$  and  $t$  estimated for the population were found to be 0.4959 and 0.5041 respectively.

PTC threshold distribution for various types of habits, such as betel and non-betel chewers, smokers and non-smokers, vegetarian and non-vegetarian were all taken together and has been presented in the Table 3. The difference between the averages of Brahmin and Karana comes to 0.868 (standard error 0.181). Now  $0.868/0.181 = 4.77$ , which is significant. These two groups exhibit many significant differences between themselves in the mean thresholds for the tasters. Similarly the average of Brahmin and Khandayat, Karana and Khandayat, Brahmin and Other castes can be compared to measure the inter-group similarities or differences.

TABLE 3

*PTC taste threshold distribution in some castes of Orissa*

Groups	Taste threshold numbers														Total
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	
Brahmin	19	1	4	7	6	8	4	3	2	1	1	—	—	—	56
Karana	15	1	2	5	6	2	5	1	1	1	1	1	—	—	41
Khandayat	9	2	4	3	6	12	4	3	2	2	1	1	—	—	49
Other castes	14	3	2	3	6	9	8	2	2	1	1	—	—	—	49
Total	57	7	12	18	24	31	21	9	7	5	4	2	—	—	19
Brahmin average of tasters														= 5.840 $\pm$ 0.265	
Karana average of tasters														= 4.942 $\pm$ 0.334	
Khandayat average of tasters														= 5.463 $\pm$ 0.037	
Other castes average of tasters														= 5.543 $\pm$ 0.359	

TABLE 4

*PTC distribution and genotypic frequencies in terms of habits*

Habit	No. observed	Absolute numbers		Percentage		Genotypes	
		Taster	Non-taster	Taster	Non-taster	T	t
Betel-chewer	102	87	15	44.63	7.65	0.7234	0.2766
Non-betel-chewer	93	79	14	40.53	7.18	0.7321	0.2679
Smoker	43	38	5	19.49	2.56	0.8381	0.1619
Non-smoker	152	141	11	72.31	5.66	0.7621	0.2379
Vegetarian	12	9	3	4.62	1.55	0.8756	0.1244
Non-vegetarian	183	166	17	85.14	8.66	0.7058	0.2942

It has been found that generally the non-smokers have more tasters than the smokers. Thus the phenomenon of smoking has insignificant effect on the 'taste buds', regarding the ability to taste PTC. In other words, the ability to taste phenylthiocarbamide, having once been inherited, is not affected by outside influences.

TABLE 5

*Comparison of non-taster frequency among smokers and non-smokers*

Investigator	Smokers no.	Non-tasters		Non-smokers no.	Chi-squares
		Non-tasters	Non-tasters		
Falcomer (1947)	60(27.70%)	217	41(23.70%)	173	0.78
Pons (1955)	19(25.30%)	75	24(24.70%)	97	0.01
Freire-Maria (1960)	5(16.70%)	30	4( 9.10%)	44	0.96
Seth (1982)	4( 2.06%)	38	20(10.31%)	156	0.148
Tripathy (present study)	5( 2.56%)	38	11( 5.66%)	141	0.361

The findings of the present study have been compared with the data of other workers in India and abroad. The chi-square values as given in Table 5, are statistically speaking, non-significant. Thus it is easy to conclude that different habits hardly affect the sensitivity to taste PTC.

It is observed in Table 6 that all the three castes of Orissa show frequency of taste-blindness which lie within the range of variation of the white populations of Asia and Europe. The Brahmins of Orissa show almost the same frequency of non-tasters and *t* gene in percentage as the Rarhi Brahmins of West Bengal and the Vednagar Nagar Brahmins of Bombay. The Karanas of Orissa almost agree with the Chandrasenya Kayastha of Western India and also of Uttar Pradesh. The Khandyats of Orissa exhibit a low frequency of taste-blindness. The Other caste groups are comparable with the samples of West Bengal and Bombay concerning their PTC taste sensitivity.

### Acknowledgement

The author's thanks are due to Utkal University authorities for providing him some financial assistance from Gyana-Vigyan Parishad, to work out his scheme 'Anthropometric status of Orissan castes—a study of physical constitution and racial affinity'. The data of the short paper were collected during the operation of this scheme.

TABLE 6  
*Phenylthiocarbamide taste distribution in some populations*

Population	Author	Number	Non-taster %	<i>t</i> -gene %
English	Harris and Kalmus			
Negros	Lee (1936)	441	31.50	56.12
(Africa)	Lee (1934)	915	6.10	24.59
Chinese	Lugg and Whyte			
(Malay)	Lugg and Whyte (1955)	50	2.00	14.14
Vednagar	Sanghvi and			
Nagar Brahmin	Khanolkar			
(Bombay)		199	26.00	51.57
Chandrasenya	"			
Kayastha		200	46.50	68.19
Punjabi	Sharma			
(Punjab)	Sharma (1959)	822	81.98	56.55
Rarhi Brahman	Das			
(West Bengal,	Das (1958)			
24-Parganas)		256	29.30	54.12
Brahmin	Present study	56	83.9	50.82
Karana	"	41	36.6	60.05
Khandayat	"	49	18.4	40.80
Other Castes	"	49	28.6	50.35
Oriyas (Orissa)	"	195	29.2	50.41

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# HYPERTRICHOSIS OF THE EAR

K. C. MALHOTRA

(Received on 1 October 1967)

**Abstract :** Various terminologies and methods used to record the presence of long hair on the human male ear have been examined. In preference to earlier nomenclature, the term 'Hypertrichosis of the ear' has been suggested. A tentative classification based on the morphological criteria of different phenotypic manifestations of the trait has been put forward. Thus four basic and thirteen sub-types have been recognized. It is proposed that all men with one or more hair on any part of the ear (at least one) should be classified as affected.

## *Introduction*

THE last decade has witnessed numerous studies, both by human geneticists and physical anthropologists, on the presence of long hair on the human male ears. Attempts have also been made to use this trait as a population marker. In describing this trait, however, various authors have used different terminologies. To us it appears desirable to devise an appropriate nomenclature not only to include the different phenotypic manifestations of this trait, but also to give adequate importance to each of the variations. It is imperative that the trait should be recorded in an exact manner and that the terminology used should not only be clear but also have an anatomical or morphological basis.

The purpose of the present paper is to examine the various terminologies used and the methods suggested for recording this trait in previous studies. An attempt has also been made to offer a tentative classification in order to minimize the subjective judgement which is often involved in descriptive traits.

### *Review of the Literature*

It was in 1898, that for the first time Cainer described long hairy growth on the ear of two Italian brothers. Soon after that Tommasi (1907a, b) published a pedigree of this trait. Since both these authors published their articles in language unknown to the present writer, it is not possible for him to deduce what nomenclature was used by Cainer and Tommasi to describe this trait. Barring these two articles, about twenty research papers are now available on the subject under consideration. Eight different terminologies have been used to describe these trait. These have been summarized in Table 1. As is noticed in categories Nos. 2, 3, 4, 5 and 6, most of the authors have emphasized the helix, pinna or rim part of the ear. It should be noted here that although these authors have apparently focussed attention on the helix of the ear, in actual practice they have also observed the trait in other part of the ear (see, in particular, Gates *et al.* 1962a; Dronamraju 1960, 1963a, b; Dronamraju and Haldane 1962; Chattopadhyay 1962; Stern *et al.* 1964). It is not always clear as to which region a particular author wants to refer to under the heading hairy pinna or hairy ear-rims etc. Equally vague is the term hairy ears. Because under this term one would also record the 'long lanugo' (primary hairs) which are retained sometimes even in adulthood.

In order to avoid confusion it may be suggested that the term 'Hypertrichosis of the ear' may be used in future studies. This would have two distinct advantages over the earlier nomenclature. Firstly, under this heading, the presence of long hairs on any part of the ear, e.g. meatus, lobe and helix would be covered and, secondly, it would make provision for not including the lanugo.

Gates *et al.* (1962a) made a suggestion to make a scale of degree of hypertrichosis having a morphological basis emphasizing the location of hairs. They devised six 'stages'. Each stage includes some regions of the ear as also the quantity of the hair present. Stage 1 is described as 'The Italian condition with long, stiff hairs and hairs on the back

and front as well as the rim of the ear' (p. 364). This classification has made the recording more complex and I do not think it will serve any useful purpose. For (i) Gates *et al.* have grouped more than one region in one stage ; (ii) certain parts, namely, meatus of the ear have not at all been included in any one of the 6 stages ; (iii) two separate variables, namely, location and amount of hair have been grouped together ; (iv) the stages do not always differentiate whether a particular part is affected on its dorsal or ventral or both the sides, and (v) there is an amount of rigidity in the classification and a score of combinations cannot be grouped under any of the stages. For instance, if only the lobe is affected, there is no provision for its inclusion in Gates *et al.*'s scheme.

Mention may also be made of a paper by Chattopadhyay (1966b). He uses three terms, namely, 'hairy ear rims', 'tragus hair' and 'hairy ear lobe'. Though this scheme is very useful and has advantages over Gate's classification, it too does not take into account all the phenotypic manifestation of the trait.

### *Suggested Terminology and Classification*

A workable and comprehensive terminology and classification should preferably be based on morphological features. There are two separate variables involved in this trait : (1) the ear and (2) long hairs (not lanugo). The external ear consists of four distinct and easily discernible parts – the external auditory meatus, the tragus, the lobule and the helix. Theoretically, the four different parts of the ear may be affected singularly or in any combination. It may be mentioned here that all these four parts have been found to be affected singularly and in various combinations (see Sarkar *et al.* 1961 ; Gates *et al.* 1962a ; Chattopadhyay 1966 etc.). The presence of hairs on these four regions thus could be referred, after their adjectives, as meatal hypertrichosis, tragus hypertrichosis, lobular hypertrichosis and helical hypertrichosis. (Figure 1.) When more than one region is affected the derived adjectives could be synthesized

by a dash. For example, if meatus and lobe are affected the term meatal-lobular hypertrichosis could be used. For the sake of uniformity it may be suggested that in case more than one region are affected simultaneously they should be recorded in the clock-wise direction, beginning with meatus, tragus, lobe and helix. If we thus recognize four regions then theoretically 10 different phenotypes (4 singularly and 6 combinations) are possible.

It has also been observed that sometimes the helix and lobe may be affected on either dorsal or ventral or on both the sides. This variation could easily be specified without much difficulty by putting the letter d (for dorsal) and v (ventral) as superscripts. For example, if the helix is only affected on its dorsal side, it could be written as helical hypertrichosis<sup>d</sup>. It has also been noted that the helix may not be affected in its entirety (Slatis and Apelbaum 1963; Sarkar *et al.* 1961, Figure 2 and 8). Sometimes the upper portion of the helix is involved ; in other cases the middle or lower portions may be affected. It would be desirable to record even these variations. The helix could easily be divided into different parts. The top or horizontal part of the helix is the upper, and the rest of the helix, which is vertical, could be divided into two equal halves, the upper half being the middle and the lower half being the lower helix (Figure 2). The letters U, M and L could be written, representing upper, middle and lower parts respectively. For example, if only the middle part of the helix is affected, it should be written as helical hypertrichosis (M). If we recognize the basic four regions plus sub-regions of lobe and helix then 17 different phenotypic patterns are theoretically possible. Assuming that each pattern is an independent one, than 180 types (17 singularly and 163 in combinations) are possible. It may, however, be mentioned that in practice one may not encounter this large number of different phenotypes. The nomenclature suggested is listed in Table 2.

#### *On the Methodological Aspect*

The other part which needs standardization is the classification of individuals into affected and unaffected categories,

Different criteria have been used to designate a person as affected or otherwise. Stern *et al.* (1964) included all men with one or more hairs on at least one pinna under the affected category. On the other hand, Slatis and Apelbaum (1968) decided that a man should be classified as affected if he has at least several hairs on the top or side of the ear. Both these criteria are inadequate and confusing. For instance, Stern *et al.* do not insist on the number or amount of hair but emphasize location, particularly the pinna. Accordingly if a person has hairs on tragus or meatus he should be grouped under the affected category. Slatis and Apelbaum emphasize both amount of hair and location. The condition of 'several hairs' laid down by these authors introduces a subjective judgement in classification. For instance, if a person has three long hairs, someone may classify him as affected whereas another may include him under the unaffected category. The other condition of location 'top or side of the ear' is open to the same objection as has been pointed out for Stern *et al.*

It may be suggested that location and amount of hair should be considered separately and that all men with one or more hairs on any part of at least one ear should be classified as affected. For recognizing basic and sub-types the same criterion should be followed.

Both ears of each individual should be examined in the way suggested by Stern *et al.* (1964). The trait should be recorded by placing a white card behind the ear and an inspection made by means of a reading glass. On the proforma used, the dorsal and ventral aspects of both the ears should be drawn and the phenotypic pattern recorded on that. This will be very useful for classificatory purposes and would also provide a permanent record.

**Hair quantity:** The quantity of hair varies considerably from a single hair to heavy bushiness. The recording of this feature would give a great deal of knowledge of degree of penetrance of this trait. Sarkar *et al.* (1961) have suggested

a very useful scale for this purpose. They proposed a scale of hairiness based upon its amount as follows : very scanty, scanty, medium, marked, very marked or bushy. This scale should be retained and applied separately for each type of hypertrichosis. This is important because it has been reported that even when the helix shows a marked hypertrichosis, the degree may be scanty or even very scanty for the lobe.

**Hair colour :** Though not much work has been done on this aspect of hypertrichosis of the ear, it is suggested that the colour of the hairs may also be recorded. The best way of achieving this would be to compare it with some standard chart, as is done in the case of head hair. In the absence of a chart, however, categories such as white, light brown, medium brown, dark brown, black, etc. may be useful.

**Hair texture :** The texture of hairs on the ears may also vary and it may be recorded as fine, medium and coarse.

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TABLE 1

Nomenclature	Authors
1. Hairy Ears	Gates (1957, 1960) and Gates <i>et al.</i> (1962)
2. Hairy Ear Rims	Gates <i>et al.</i> (1961), Chattopadhyay (1966b).
3. Hairy Pinnae	Gates and Vella (1962), Chattopadhyay (1962, 1966), Dronamraju and Haldane (1962). Sarkar <i>et al.</i> (1962), Slatis and Apelbaum (1963), Stern, Curt <i>et al.</i> (1964).
4. Hypertrichosis of the Ear Rims	Sarkar, <i>et al.</i> (1961).
5. Hypertrichosis of the Pinnae	Dronamraju (1960).
6. Hypertrichosis of Pinnae auris	Dronamraju (1963a, b), Chattopadhyay (1964).
7. Tragus hair	Chattopadhyay (1966b).
8. Hairy Ear lobe	Chattopadhyay (1966b).

TABLE 2

Parts of the Ear affected by long hairs	Nomenclature suggested
1. Meatus	Meatal hypertrichosis
2. Tragus	Tragus hypertrichosis
3. Lobe	Lobular hypertrichosis <sup>d</sup>
(i) Dorsal	Lobular hypertrichosis <sup>v</sup>
(ii) Ventral	Lobular hypertrichosis <sup>d, v</sup>
(iii) Dorsal and Ventral	
4. Helix	Helical hypertrichosis <sup>d</sup>
(i) Dorsal	Helical hypertrichosis <sup>v</sup>
(ii) Ventral	Helical hypertrichosis <sup>d, v</sup>
(iii) Dorsal and Ventral	
(a) Lower	Helical hypertrichosis (L) <sup>d</sup>
(i) Dorsal	Helical hypertrichosis (L) <sup>v</sup>
(ii) Ventral	Helical hypertrichosis (L) <sup>d, v</sup>
(iii) Dorsal and Ventral	
(b) Middle	Helical hypertrichosis (M) <sup>d</sup>
(i) Dorsal	Helical hypertrichosis (M) <sup>v</sup>
(ii) Ventral	Helical hypertrichosis (M) <sup>d, v</sup>
(iii) Dorsal and Ventral	
(c) Upper	Helical hypertrichosis (U) <sup>d</sup>
(i) Dorsal	Helical hypertrichosis (U) <sup>v</sup>
(ii) Ventral	Helical hypertrichosis (U) <sup>d, v</sup>
(iii) Dorsal and Ventral	

Key—d=dorsal; v=ventral; L=Lower; M=Middle, and U=Upper

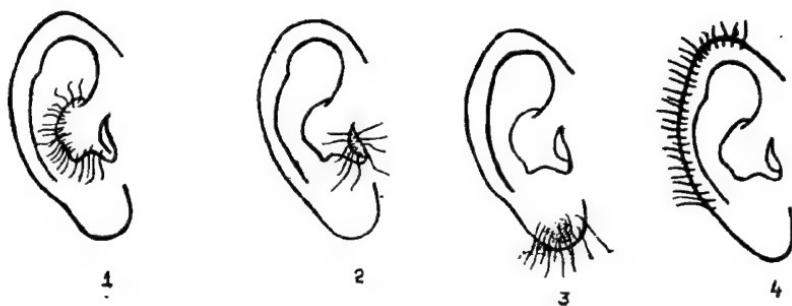


Fig. 1

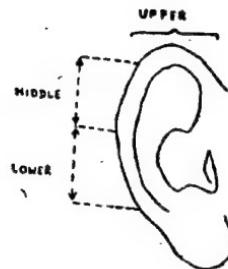


Fig. 2

# DERMATOGLYPHIC STUDY AMONG THREE BENGAL CASTES

DHARMADAS SARKAR

( Received on 27 January 1968 )

**Abstract :** The purpose of the present paper is to study the dermal ridge-pattern and count-variability among three castes of Nadia district in West Bengal, and to find out the biological relationship among them on the hypothesis that the trait is a criterion of ethnic relationship.

## *Introduction*

THE investigation into the study of human variation with regard to certain physical characters of anthropological significance has revealed a positive result of population differences. And there are some characters which are so genetically ingrained that they, obviously, retain their endowments through generations in the population. Among the polygenetically controlled traits, the dermal configurations are, perhaps, the most effective ones in the study of population variation because of their high variability with less adaptive value, associated with no post-natal modifications.

The purpose of the present paper is to study the dermal ridge pattern and count variability among three caste groups of Nadia district in West Bengal, and to find out the biological relationship among them, on the hypothesis that the trait is a criterion of ethnic relationship.

During April-June, 1963, the finger and palmar impression of 352 unrelated male individuals belonging to the three caste groups were collected. The samples were drawn from various localities in the district.

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The three caste groups, namely, Brahmin (no. = 117), Kayastha (no. = 114), and Bagdi (no. = 121), occupy different status in the social hierarchy of Hindu society. While the Brahmin and Kayastha are in the higher social order (Brahmin occupying the highest position), the Bagdi are placed in the lower. The present attempt is restricted only to the study of apical dermal configurations.

The prints were obtained according to the standard technique of Cummins and Midlo (1948), using printer's ink. The prints are classified in terms of Galton's three-fold classification of whorl, loop (radial and ulnar) and arch.

Due to the loss of third phalanx in left digit II of one member of the Bagdi caste, the total estimable number of finger prints of the caste group falls short of one print.

### *Results and Discussion*

#### **Papillary pattern**

In Table 1 the digit-wise distribution of the papillary pattern frequencies among the three caste groups of Nadia district has been presented.

(a) *Whorl* : From the distribution of whorl, it is evident that the digit IV has recorded the highest occurrence of whorl which is followed by a gradual decreasing trend in the other digits. The frequency of whorl is found to be highest in digit IV, less in I, smaller in II, and finally lowest in III and V. This digit-wise diminutive trend which holds valid for Brahmin and Bagdi groups is, however, found to deviate in Kayastha. In Kayastha the distribution of whorl differs in digit III and V giving rise to an order which follows through digit V to III. This is contrary to what has been observed for Brahmin and Bagdi populations.

(b) *Loop ulnar* : For all the caste groups the ulnar loop distribution is found to occur most in digits V and III, of which the former displays the highest incidence. However, in addition to the above, Kayastha population

shows an excess of ulnar pattern in digit I and II over the others. In terms of occurrence of the ulnar loop in digit it appears, in general, that digit V and III are the most frequent, while digit II and sometimes digit IV are the less.

- (c) *Loop radial*: It is found highest in digit II and none in digit V in all the caste groups. The Kayastha, however, show an increase in the radial pattern occurrence in digit II over that of the Brahmin or Bagdi communities.
- (d) *Arch*: In this configuration also, digit II of all the caste populations exhibits the highest frequency, while digit IV claims to have the lowest, except for that of the Kayastha which show no involvement at all. The general distribution of arch pattern shows a decreasing order from digit II through digit I, III, V and finally to IV.

In Table 2 the distribution of principal papillary patterns and their indices have been recorded. It will be seen that all the caste groups have a higher percentage of loop over whorl configurations. It is interesting to note that the Brahmin ( $W = 43\%$ ,  $L = 53\%$ ), and the Bagdi ( $W = 45\%$ ,  $L = 52\%$ ) come closer than the Kayastha ( $W = 40\%$ ,  $L = 57\%$ ) in respect of whorl and loop patterns. However, it may be appreciated that no such variation of a considerable magnitude is to be found among the populations in respect of the frequency estimates of whorl and loop configurations which lie within a range of five units only. In arch order also the populations record a more or less uniform size varying between 2.46% and 2.80%.

In order to examine the justifiability of the above observations and to find out the significance in the occurrence of the principal papillary patterns among the caste populations, *Chi<sup>2</sup>* values for intergroup heterogeneity are calculated. From the values of *Chi<sup>2</sup>* with two degrees of freedom which are arranged in Table 3, it can be inferred that none of these population samples differ significantly from one another at 5% level of probability. Thus, in respect of different pattern type variables

in the three populations, no statistical heterogeneity can be detected among them, as the magnitude of the pattern variations is not large enough.

Dankmeijer (1938) demonstrated the existence of striking variations among different population groups with regard to the occurrence of radial loop pattern, and, as such, he recommended that the radial loop pattern estimates may also be considered usefully as a marker in population studies.

In this context, it would be of interest to employ another statistics for testing the significance with regard to the differential distribution of the radial loop between the caste groups to find out the variations if any. The relative values of '*t*' are presented in Table 4. It will be seen from the table that the results of this test reveal no differences but they, in a general way, confirm the information derived from the inter-group variations relating to the principal pattern types.

### *Indices and Frequencies of Papillary Patterns*

Frequencies of the main papillary patterns in individual hands, both hands combined, and the indices derived out of them are given in Table 5.

It appears from Table 5 that pattern intensity (Cummins 1943) and whorl-loop index (Furahatta 1927) of the right hand among all the caste groups are comparatively higher than in the left. Exception is however seen in the case of arch-whorl index (Dankmeijer 1938) where the above trend is found in reverse order in the Kayastha and Bagdi group (i.e., arch-whorl index is increased in the left hand). Similarly, when both the hands (right and left) are considered, indices of the pattern intensity and whorl-loop are seen to be relatively higher among the Bagdis (P. I. I. 14.23, W/L. I. 85.92). A comparative rise in the whorl-loop or in the pattern intensity index may be due to subsequent increase of arch and whorl configurations while the loop plays a less important part in influencing the indices and thus proves to be a delicate indicator (Dankmeijer 1938). Though the three caste groups considerably vary in mean pattern intensity index, the '*t*' test for significance, however, does not yield any statistically significant result as may be seen from Table 6.

### Ridge-count

Finger ridge-count being metrical in nature and completely objective, possibly reveals a more complete picture of the print than the study of pattern types. Thus, in Table 7, mean S. D., C.V. of the digit-wise ridge-count and total ridge-count for Brahmin, Kayastha and Bagdi have been worked out.

It will be seen that in Brahmin and Bagdi the ridge-count is highest in digit I and then found to be in a decreasing gradient through digits IV, V, III, and finally lowest in digit II. The finding is in agreement with Holt's results (1957). It is of interest to note that the Kayastha deviate in this respect, expressing the highest ridge-count for digit IV and higher in digit I.

The right hand of Brahmin and Kayastha has a higher count over the left, while in the case of Bagdi the left hand shows a higher value. In any case, the bilateral asymmetry is, however, expressed with respect to ridge-count.

In total ridge-count ( $R + L$ ), the Brahmin and Bagdi present lowest and highest values respectively, the Kayastha occupying an intermediate position. The same order can also be noticed when the quantitative value of Bonnevie is also accounted for. The various measures of variability of the total ridge-count definitely indicate that the Brahmin are more variable, next in the order are the Bagdi, while least variable are the Kayastha.

Though the total ridge-count values for three groups apparently show inter-group differences, the ' $t$ ' test of significance does not reveal the statistically significant results as may be seen from Table 8.

### Summary

The study of finger-pattern and ridge-count among Brahmin, Kayastha, and Bagdi adult male populations of Nadia district, West Bengal, is made. The populations occupy different social statuses in the hierarchy of Hindu society. The position of Brahmin, in this scale, is highest, next come the Kayastha, while the Bagdi occupy the lowest

positionm. In the occurrence of principal pattern types and in pattern intensity index no significant variations have been found among the population groups. On several counts, the Brahmins are found to be more variable than others. The S. D. of ridge-counts of right hand, both hands combined, and also the quantitative value, is higher in Brahmin, so that the C. V. in Brahmins is considerably higher. The Kayastha are least variable. In the total ridge-count, however, none of the samples differs significantly from the rest. Thus, in the finger print pattern, or in the ridge-count, the three populations are not heterogeneous.

The Brahmin and the Bagdi are close in respect of incidences of whorl and loop pattern and also in pattern intensity index, but they differ in total ridge-count. The Brahmin and Kayastha, however, approximate in total ridge-count.

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TABLE 1

*Digit-wise distribution of papillary patterns*

Caste : Brahmin, Sex - Male, Dt. Nadia

Patterns                    Digits (Right and Left combined)

	I (N = 234)	II (N = 234)	III (N = 234)	IV (N = 234)	V (N = 234)
	%	%	%	%	%
Whorl	59.83	41.02	32.48	60.68	23.50
Loop U	36.75	38.03	63.67	38.46	75.64
R	0.43	13.25	1.28	0.43	-
Arch	2.99	7.69	2.56	0.43	0.85

Caste : Kayastha, Sex : Male, Dt. Nadia

	(N = 228)				
	%	%	%	%	%
Whorl	53.51	35.53	24.12	60.96	28.07
Loop U	44.74	42.98	72.37	38.60	71.49
R	0.44	14.03	0.44	0.44	-
Arch	1.81	7.46	3.07	-	0.44

Caste : Bagdi, Sex : Male, Dt. Nadia

	(N = 242)	(N = 241)*	(N = 242)	(N = 242)	(N = 242)	Remarks
	%	%	%	%	%	
Whorl	63.22	43.98	26.03	66.94	24.79	* One finger tip in LII is absent
Loop U	38.47	37.34	70.25	32.23	78.97	
R	0.83	12.03	1.65	-	-	
Arch	2.48	6.64	2.07	0.83	1.24	

TABLE 2

*Comparative distribution of the principal pattern types and their indices among the caste groups*

Caste group	Sex	Pattern Types			Indices				
		Whorl %	Loop % U R	Total %	Arch	P. I. I	Ar/W. I	W/L. I	
Brahmin (no.=117)	M	43.50	50.51 3.08	53.59	2.90	14.06	6.67	81.17	
Kayastha (no.=114)	M	40.44	54.03 3.07	57.10	2.46	13.80	6.08	70.82	
Bagdi (no.=121)	M	44.99	49.46 2.89	52.36	2.65	14.23	5.89	85.92	

TABLE 3

*Values of Chi-square in the distribution of principal pattern types (Whorl, Loop and Arch) among the Caste groups (Brahmin, Kayastha, Bagdi)*

Groups compared	Chi-square value	Remarks
Brahmin and Kayastha	2.876	Not significant
Brahmin and Bagdi	0.627	" "
Kayastha and Bagdi	5.378	" "

TABLE 4

*Test of significance in the percentage distribution of radial loops among the caste groups*

Groups compared	D. F.	Values of 't', when $t^* = 0.05$	Remarks
Brahmin and Kayastha	2308	0.28	Not significant
Brahmin and Bagdi	2377	1.73	" "
Kayastha and Bagdi	2347	1.64	" "

TABLE 5

*Distribution of papillary patterns handwise, both hands (combined),  
and the indices derived out of them*

Caste group	Hand and no. of fingers	Frequency of pattern types in %			Indices		
		Whorl	Loop	Arch	P.I.I.	Ar/W.I.	W/L.I.
Brahmin	L. Hand	240	330	15	13.84	6.24	72.72
	(n=585)	41.02	56.41	2.56			
Kayastha	L. Hand	221	334	15	13.61	6.78	68.16
	(n=570)	38.77	58.60	2.63			
Bagdi	L. Hand	271	317	16	14.22	5.91	85.50
	(n=604)	44.87	52.48	2.65			
Brahmin	R. Hand	269	297	19	14.27	7.07	80.57
	(n=585)	45.98	50.77	3.25			
Kayastha	R. Hand	240	317	13	13.98	5.42	75.71
	(n=570)	42.10	55.61	2.28			
Bagdi	R. Hand	273	316	16	14.25	5.85	86.39
	(n=605)	45.12	52.28	2.64			
Left and Right hand combined		509	627	34	14.06	6.67	81.17
Brahmin	(n=1170)	43.50	53.59	2.90			
Kayastha	"	461	651	28	13.80	6.08	70.82
	(n=1140)	40.44	57.10	2.46			
Bagdi	"	544	633	32	14.23	5.89	85.92
	(n=1209)	44.99	52.36	2.65			

TABLE 6

*Index of pattern intensity and its significance*

Caste groups	N	Range of P. I. I.	Pattern intensity index	Test of significance in Mean P. I. I.	Groups compared of 't'		
					S.E.	S.D. $\pm$ S.E.	Values Remarks
Brahmin	117	8.0-20.0	14.06 $\pm$ 0.32	3.52 $\pm$ 0.23	Brahmin & Kayastha	0.86	Not significant
Kayastha	114	7.0-20.0	13.69 $\pm$ 0.29	3.14 $\pm$ 0.21	Brahmin & Bagdi	0.37	"
Bagdi	121	4.0-20.0	14.22 $\pm$ 0.30	8.32 $\pm$ 0.21	Kayastha & Bagdi	1.26	"

TABLE 7

*Mean ridge counts and their statistical constants*

Caste : Brahmin, Sex : Male, Dt. Nadia

Fingers	n	Mean $\pm$ S.E.	S.D. $\pm$ S.E.	C.V. $\pm$ S.E.
L I	117	16.86 $\pm$ 0.53	5.73 $\pm$ 0.37	33.79 $\pm$ 2.21
L II	117	12.06 $\pm$ 0.55	5.96 $\pm$ 0.39	49.42 $\pm$ 3.23
L III	117	13.36 $\pm$ 0.48	5.20 $\pm$ 0.34	38.92 $\pm$ 2.54
L IV	117	15.94 $\pm$ 0.43	4.66 $\pm$ 0.30	29.23 $\pm$ 1.91
L V	117	14.14 $\pm$ 0.43	4.61 $\pm$ 0.30	32.60 $\pm$ 2.13
L. Hand	117	72.47 $\pm$ 1.96	21.22 $\pm$ 1.39	29.28 $\pm$ 1.91

R I	117	18.69 $\pm$ 0.52	5.62 $\pm$ 0.37	30.07 $\pm$ 1.97
R II	117	11.83 $\pm$ 0.60	6.48 $\pm$ 0.42	54.78 $\pm$ 3.58
R III	117	12.74 $\pm$ 0.49	5.31 $\pm$ 0.35	41.68 $\pm$ 2.72
R IV	117	15.93 $\pm$ 0.45	4.86 $\pm$ 0.32	30.51 $\pm$ 1.99
R V	117	13.56 $\pm$ 0.44	4.82 $\pm$ 0.31	35.55 $\pm$ 2.32
R. Hand	117	72.76 $\pm$ 2.02	21.85 $\pm$ 1.43	30.03 $\pm$ 1.96

L+R.  
combined :

I	234	17.83 $\pm$ 0.37	5.74 $\pm$ 0.26	32.19 $\pm$ 1.49
II	234	11.94 $\pm$ 0.41	6.23 $\pm$ 0.29	52.18 $\pm$ 2.41
III	234	13.05 $\pm$ 0.34	5.26 $\pm$ 0.24	40.31 $\pm$ 1.86
IV	234	15.93 $\pm$ 0.31	4.73 $\pm$ 0.22	29.88 $\pm$ 1.38
V	234	13.85 $\pm$ 0.31	4.73 $\pm$ 0.22	34.15 $\pm$ 1.58
Total Ridge counts	117	145.28 $\pm$ 3.91	42.27 $\pm$ 2.76	29.11 $\pm$ 1.90
Q. V.	117	14.52 $\pm$ 0.39	4.23 $\pm$ 0.28	29.13 $\pm$ 1.90

Table : 7 (Contd.)

*Mean ridge counts and their statistical constants*

Caste : Kayastha, Sex : Male, Dt. Nadia

Fingers	n	Mean $\pm$ S.E.	S.D. $\pm$ S.E.	C.V. $\pm$ S.E.
L I	114	16.59 $\pm$ 0.52	5.61 $\pm$ 0.37	33.82 $\pm$ 2.24
L II	114	11.82 $\pm$ 0.55	5.93 $\pm$ 0.39	50.17 $\pm$ 3.82
L III	114	13.74 $\pm$ 0.47	4.98 $\pm$ 0.33	36.24 $\pm$ 2.40
L IV	114	16.61 $\pm$ 0.46	4.95 $\pm$ 0.33	29.80 $\pm$ 1.97
L V	114	14.14 $\pm$ 0.40	4.31 $\pm$ 0.28	30.48 $\pm$ 2.02
L Hand	114	72.90 $\pm$ 1.84	19.65 $\pm$ 1.30	26.95 $\pm$ 1.78

R I	114	18.83 $\pm$ 0.53	5.64 $\pm$ 0.37	30.77 $\pm$ 2.04
R II	114	11.88 $\pm$ 0.59	6.27 $\pm$ 0.41	52.78 $\pm$ 3.50
R III	114	13.26 $\pm$ 0.46	4.90 $\pm$ 0.32	36.95 $\pm$ 2.45
R IV	114	16.57 $\pm$ 0.43	4.58 $\pm$ 0.30	27.64 $\pm$ 1.83
R V	114	14.04 $\pm$ 0.44	4.67 $\pm$ 0.31	33.26 $\pm$ 2.20
R Hand	114	74.09 $\pm$ 1.82	19.40 $\pm$ 1.28	26.18 $\pm$ 1.73

**L and R combined :**

I	228	17.46 $\pm$ 0.38	5.69 $\pm$ 0.27	32.59 $\pm$ 1.53
II	228	11.85 $\pm$ 0.40	6.10 $\pm$ 0.28	51.48 $\pm$ 2.41
III	228	13.50 $\pm$ 0.33	4.95 $\pm$ 0.23	36.67 $\pm$ 1.72
IV	228	16.59 $\pm$ 0.31	4.76 $\pm$ 0.22	30.58 $\pm$ 1.43
V	228	14.09 $\pm$ 0.30	4.49 $\pm$ 0.21	31.87 $\pm$ 1.49
Total Ridge counts	114	146.99 $\pm$ 3.53	37.72 $\pm$ 2.50	25.66 $\pm$ 1.70
Q. V.	114	14.70 $\pm$ 0.35	3.77 $\pm$ 0.25	25.65 $\pm$ 1.70

Table 7 (Contd.)

*Mean ridge counts and their statistical constants*

Caste : Bagdi, Sex : Male, Dt. Nadia

Finger	n	Mean $\pm$ S.E.	S.D. $\pm$ S.E.	C.V. $\pm$ S.E.	Remarks
L, I	121	17.38 $\pm$ 0.50	5.54 $\pm$ 0.35	31.88 $\pm$ 2.05	* One finger tip in L, II is absent
L, II*	120*	12.75 $\pm$ 0.57	6.23 $\pm$ 0.40	48.86 $\pm$ 3.15	
L, III	121	14.23 $\pm$ 0.52	5.75 $\pm$ 0.37	40.41 $\pm$ 2.60	
L, IV	121	16.35 $\pm$ 0.48	5.27 $\pm$ 0.34	32.23 $\pm$ 2.07	
L, V	121	14.10 $\pm$ 0.45	5.00 $\pm$ 0.32	35.48 $\pm$ 2.28	
L, Hand	121	74.70 $\pm$ 2.05	22.51 $\pm$ 1.45	30.13 $\pm$ 1.94	
R, I	121	18.51 $\pm$ 0.55	6.08 $\pm$ 0.39	32.74 $\pm$ 2.10	
R, II	121	12.33 $\pm$ 0.50	6.55 $\pm$ 0.36	45.01 $\pm$ 2.89	
R, III	121	13.46 $\pm$ 0.45	4.96 $\pm$ 0.32	36.85 $\pm$ 2.37	
R, IV	121	15.64 $\pm$ 0.43	4.74 $\pm$ 0.30	30.81 $\pm$ 1.95	
R, V	121	13.93 $\pm$ 0.42	4.68 $\pm$ 0.30	33.60 $\pm$ 2.16	
R, Hand	121	73.88 $\pm$ 1.86	20.43 $\pm$ 1.31	27.65 $\pm$ 1.78	
L and R combined :					
I	242	17.95 $\pm$ 0.37	5.83 $\pm$ 0.26	32.48 $\pm$ 1.48	* One finger tip in L, II is absent
II	241*	12.54 $\pm$ 0.38	5.90 $\pm$ 0.27	47.05 $\pm$ 2.14	
III	242	13.85 $\pm$ 0.34	5.38 $\pm$ 0.24	38.84 $\pm$ 1.76	
IV	242	15.99 $\pm$ 0.32	5.02 $\pm$ 0.23	31.89 $\pm$ 1.43	
V	242	14.02 $\pm$ 0.31	4.84 $\pm$ 0.22	34.52 $\pm$ 1.57	

## Total Ridge counts :

121	148.59 $\pm$ 3.81	41.96 $\pm$ 2.70	28.24 $\pm$ 1.81
Q, V.	121	14.87 $\pm$ 0.38	4.19 $\pm$ 0.27

TABLE 8

*Test of significance in total ridge counts between the caste groups*

Groups compared	Values of 't'	Remarks
Brahmin and Kayastha	0.33	Not significant
Brahmin and Bagdi	0.62	" "
Kayastha and Bagdi	0.31	" "

# FINGER-PRINTS OF THE KORKU

ARABINDA BASU

(Received on 8 February 1968)

**Abstract:** A study has been made of the finger-prints of the Korku, a Mundari-speaking tribe from Melghat forest region. The frequency of whorls, loops and arches was ascertained, and the findings compared with similar data from other Mundari-speaking tribes of India.

## *Introduction*

THE Korku, a tribe speaking a Mundari language, are found chiefly in the Satpura Hills, Hosugabad and Nimar districts of Madhya Pradesh and in the Melghat Hill forest region in Amravati district of Maharashtra. The 1961 Census records the population of Korku in Melghat Taluk, Amravati district, as 60,279. The tribe is divided into several septs, and marriage within the same sept is not permitted. Karve and Dandekar (1951) consider that linguistically and ethnically the Korku are an isolated and intrusive group in the Maharashtra region.

The object of this paper is to place the finger-print data of the Korku on record, so as to increase the body of comparative racial records available, and to make some comparisons between the results in the Korku and other Mundari-speaking tribes.

## *Material method*

The finger-print data which form the basis of this communication were collected in January, 1964, from Melghat forest region.

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Rolled finger-impressions were taken from 100 male Korku and were analysed according to the method advocated by Cummins and Midlo (1961). With regard to ridge-counting the general principles adopted by Holt (1949) were used in the present study. Altogether 1000 digital impressions were obtained, out of which 15 indistinct and smeared finger-tip patterns had to be rejected. Hence 985 digital impressions of 100 Korku subjects could be utilized for the present study.

### Results

Table 1 sets forth the percentile frequencies of pattern types on the individual digits in right and left hand of Korku males. It is observed that whorls are slightly more numerous than loops. True whorls are found to be more frequent on right hand in all the digits. Descending rank order of the whorls in prevalence is IV, I, II, III and V. Like most other population groups the Korku show deficiency of whorls on digits III and V.

The descending sequence of ulnar loops is V, III, I, IV and II. As in most other population groups, radial loops are greatly concentrated in digit II. Excess of loops in the left hand is observed in digits I, III and IV. In digits II and V great correspondence between right and left hand exists for both whorls and loops.

Arches constitute very low percentage of the total occurrence of the three principal pattern types. Arches are totally absent in digits IV and V, but are concentrated mainly in the second digit of both the hands.

So far as the author is aware the only other data on Korku finger based on 31 male individuals are available from the work of Geipel (1961). The present finding on Korku finger-print agrees well with Geipel's observations on the Korku which likewise showed 55.8% whorls, 42.6% loops and 1.6% arches. Chi-square test also reveals that the two Korku samples are clearly homogeneous in their finger-print type frequencies ; the value of chi-square = 166, d.f. = 2.

**Ridge-count:** Ridge-count provides much more accurate assessment of the print than the analysis of the various pattern types. In Table 2 are given the mean ridge-counts of Korku males for individual digits for right and left hand separately, the sum of the right hand digits ( $\Sigma R$ ), the left hand digits ( $\Sigma L$ ) and  $\Sigma(R + L)$ , with standard deviations and coefficient of variation. The standard deviations of these measures appear smaller when compared with Holts (1961) more extensive English series. Descending ranking order of individual digits for mean ridge-counts are 1, 4, 5, 3, 2 for both right and left hands. Similar ranking order is also predominant in Holt's English series. Bimanuar difference in mean ridge-counts between fingers shows that excepting for digit I the differences in means in all other digits are not significant. It is apparent that right hand counts are larger in the first, second and fifth digits than the corresponding digits of the left hand. The mean ridge-counts for  $\Sigma R$ ,  $\Sigma L$  and  $\Sigma(R + L)$  are 65.78, 68.00 and 134.75 respectively.

### *The Korku and other Mundari-speaking tribes*

In Table 3 Korku finger-print data together with the indices of Furuhata (100 W/L), Dankmeijer (100 A/W) and Pattern Intensity (P. I. I.) are compared with those found in other Mundari-speaking tribes of India. The Korku, Santal and Munda show slightly higher frequency of whorls than that of loops; whereas three Mundari-speaking tribes, namely, the Sabara and Juang from Orissa and Asura from Bihar, show more loops than whorls. In Korku, whorls show a medium prevalence, much as in the Munda and Santal. In arch frequency no striking variations are observed among different Mundari-speaking tribes; they display values ranging from 1.85 to 1.97 per cent. Chi-square test, however, demonstrates highly significant difference, suggesting heterogeneity in the finger-print type frequencies among the Mundari-speaking tribal groups.

It will be apparent from an examination of indicial values that in Pattern Intensity and Dankmeijer's Index, the Korku resemble other Mundari-speaking tribes. It is evident that in

the six Mundari-speaking tribes the Pattern Intensity Index ranging from 13.61 to 15.09 and Dankmeijer's Index ranging from 3.07 to 3.98 which reflects that variations in respect of these two indices, are not appreciably marked. Contrary to these two indices, Furuhata Index shows distinct variations in the Mundari-speaking tribes compared. They have an index ranging from 57.26 to 114.45.

In order to get an impression of dermatoglyphic affinities between the Korku and other Mundari-speaking tribes of India, estimates of dermatoglyphic distance between Korku and other Mundari-speaking tribes have been calculated, following the method suggested by Hughes (1967). The results are summarized in Table 4. An examination of the mean square distance suggests that the Korku, in as far as dermatoglyphics is concerned, seem to be much closer to the Munda and the Santal than to other Mundari-speaking tribes. The distance between Korku and Asura appears to be maximum.

Figures for ridge-counts of other Mundari-speaking tribes have not been worked out by the authors concerned, and therefore cannot be utilized for comparative study. Comparative data for mean ridge-counts for other Indian population samples are also very scanty. Table 5 summarizes ten population groups from India on which ridge-counts have been carried out. The Korku total ridge-counts are slightly lower than those for other Indian samples. Results concerning mean total ridge-counts in most of the Indian population groups indicate no distinct variations. In fact, the total ridge-count values for Indian population groups other than the Muslim, lie between the small range of 130 and 150. It is interesting to note that the Muslim community show considerably higher ridge-count values than the other Indian population groups. 'T'-test reveals that there exists no significant variation between Kashmiri and U. P. Muslims ( $t=0.70$ ) in total ridge-counts.

### *Summary*

The results of finger-print analysis of Korku, a Mundari-speaking tribe from Melghat forest region (Maharashtra) are

briefly summarized here. The frequencies of whorls, loops and arches were ascertained, and these findings compared with similar data from other Mundari-speaking tribes of India. The following frequencies of the pattern types of the male Korkus were observed as 51.23% whorls, 47.02% loops, and 1.74% arches. The mean ridge-counts for  $\Sigma R$ ,  $\Sigma L$  and  $\Sigma(R + L)$  are 65.78, 68.00 and 134.75 respectively.

It has been shown that six Mundari-speaking tribes under discussion are heterogeneous in the finger-print type frequencies ( $\text{Chi-square} = 76.090$ , D. F. = 10,  $P < 0.001$ ). When arch frequency is considered, they do not show marked variations and cluster within a small range of 1.35 to 1.97%. The Korku, however, show closer relationship in finger-print patterns to the Munda and Santal than to other Mundari-speaking tribes.

Pattern Intensity Index and Dankmeijer's Index reflect that variations in respect of these two indices are not appreciably marked among the Mundari-speaking tribes. Contrary to these two indices, Furuhata Index shows distinct variation.

The results concerning mean total ridge-counts in most of the Indian population groups compared, other than Muslim communities, indicate no distinct variation.

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TABLE I  
*Distribution of finger-print patterns in Korku males*

Digits	Side	Whorls			Loops			Arches			
		True whorls	Lateral pocket	Central pocket	Twin loops	Total	Uniar	Radial	Total	Tented arches	Other arches
I	R	58.00	5.00	2.00	5.00	70.00	29.00	0.00	29.00	0.00	1.00
	L	34.37	6.25	1.04	16.67	58.83	40.63	0.00	40.63	0.00	1.04
	R & L	46.18	5.62	1.52	10.83	64.16	34.81	0.00	34.81	0.00	1.02
II	R	41.84	3.06	8.06	4.08	52.04	32.65	9.18	41.84	0.00	6.12
	L	38.54	5.21	4.17	5.21	58.13	35.42	5.21	40.63	2.08	6.24
	R & L	40.19	4.13	3.61	4.64	52.58	34.03	7.19	41.23	1.04	6.18
III	R	30.30	3.03	5.05	1.01	39.39	58.59	0.00	58.59	0.00	2.02
	L	27.55	3.06	1.02	5.10	36.73	62.24	0.00	62.24	0.00	1.02
	R & L	28.92	3.04	3.03	3.05	38.06	60.41	0.00	60.41	0.00	1.52
IV	R	58.00	1.00	9.00	1.00	69.00	30.00	1.00	31.00	0.00	0.00
	L	46.00	2.00	7.00	5.00	60.00	39.00	1.00	40.00	0.00	0.00
	R & L	52.00	1.50	8.00	3.00	64.50	34.50	1.00	35.50	0.00	0.00
V	R	31.31	1.01	3.03	1.01	36.36	62.63	1.01	63.64	0.00	0.00
	L	24.24	0.00	5.05	8.08	37.37	61.62	1.01	62.63	0.00	0.00
	R & L	27.27	0.50	4.04	4.54	36.86	62.12	1.01	63.18	0.00	0.00
All digits	R	43.89	2.62	4.43	2.42	53.36	42.57	2.24	44.81	0.00	1.83
	L	34.14	3.30	3.66	8.01	49.11	47.78	1.44	49.23	0.42	1.66
	R & L	39.01	2.96	4.04	5.21	51.23	45.17	1.84	47.02	0.21	1.74

TABLE 2

*Ridge-count characteristics of the Korku males*

Digit	Left (L)			Right (R)		
	$\bar{X}$	S. D.	C. V.	$\bar{X}$	S. D.	C. V.
I	14.74	4.24	28.76	16.42	4.69	28.56
II	11.48	5.48	47.74	11.57	5.57	48.14
III	12.59	4.80	38.13	12.22	5.00	40.92
IV	14.30	4.69	32.80	14.25	4.12	28.99
V	12.70	3.61	28.43	13.14	3.87	29.45
$\Sigma L \bar{X} = 68.00$		S. D. = 14.35	C. V. = 21.10	$\Sigma R \bar{X} = 65.78$	S. D. = 22.56	C. V. = 34.30
					$\Sigma (R + L) \bar{X} = 134.75$	S. D. = 33.75
					C. V. = 25.05	

TABLE 3

*Comparative finger-print data for various Mundari-speaking tribes (males)*

Tribes	Locality	n	W	L	A	100A/W	100W/L	P. I. I.	Source
Korku	Maharashtra	100	51.23	47.02	1.74	3.40	108.95	14.95	Present study
Jnang	Orissa	74	42.00	56.64	1.36	3.25	74.15	14.06	Sarkar and Banerjee (1957)
Sabar	Orissa	54	42.42	55.89	1.69	3.98	75.92	14.07	Sarkar and Banerjee (1957)
Asura	Bihar	89	35.92	62.73	1.35	3.76	57.26	13.61	Dutta and Gupta (1967)
Santal	West Bengal	62	52.51	45.88	1.61	3.07	114.45	15.09	Chakravartii (1980)
Munda	Bihar	112	49.65	48.38	1.97	3.97	102.58	14.77	Chakravartii (1980)

Heterogeneity Chi square = 76.090, D. F. = 10, P. &lt; 0.001

TABLE 4

*Estimates of dermatoglyphic distance (mean square distances) between  
Korku and other Mundari-speaking tribes*

Tribes	Frequency differences			Mean square distances
	W	L	A	
Korku	0.0	0.0	0.0	0.0
Santal	+ 1.3	- 1.1	- 0.1	1.0
Munda	- 1.6	+ 1.4	+ 0.2	1.5
Sabar	- 8.8	+ 8.9	- 0.1	52.2
Juang	- 9.2	+ 9.7	- 0.4	59.6
Asura	- 15.3	+ 15.7	- 0.4	160.2

TABLE 5

*Means and standard deviations for total ridge-count in  
various India male samples*

Population group	Author	No.	Mean	S.D.
Korku	Present study	100	134.75	33.47
Lambadi	Gupta, Basu and Sarkar (1961)	51	140.46	-
Onge	Gupta and Basu (1960)	24	135.40	-
Parsi	Mavelwala (1963)	200	139.81	45.39
U. P. Brahman	Singh (1961)	203	145.30	39.20
Rajput	Singh (1961)	103	146.66	41.60
Ahir	Singh (1961)	114	149.74	36.70
U. P. Muslim	Singh (1961)	100	161.00	31.50
Tharu	Srivastava (1965)	279	130.61	38.47
Kashmiri Muslim	Sen and Gupta (unpublished)	101	157.14	46.52

# INDIC ELEMENTS IN TIBETAN CULTURE : POLITY

NIRMAL CHANDRA SINHA

( Received on 10 December 1968 )

**Abstract :** While much has been written about Indian influence on the religion and literature of Tibet, little is known about any Indian influence on the political system of traditional Tibet, i.e. government by the monks and priests.

The article traces the sanction for government by the Lamas in (i) the basic concept of early Buddhism ; (ii) the basic concept of Mahayana Buddhism ; and (iii) the Indian ethos which sought harmony between spiritual and temporal needs.

**E**XCHANGE of ideas like exchange of commodities between two neighbouring countries is a norm of history. Relations between India and Tibet illustrate this truism. Even the Himalayas were not sufficient barriers and this relationship was not a one-way traffic in commerce or culture.

While much is on record regarding India's impact on Tibetan culture, Tibetan influence on Indian culture remains obscure. With the antiquity of Tantra traced back to the Indus Civilization and with Mount Kailas as the focal point in Tantra, regular contacts and exchanges between the mystics on both sides of the Himalayas in pre-Buddhist and even pre-Vedic times are no longer ruled out. Some scholars surmise that Indian Tantra was developed from the pre-Buddhist native religion of Tibet, called Bon.

In the first decade of this century some British scholars had suggested Tibeto-Mongoloid origins for several republican oligarchic tribes of the Himalayas, and that the Buddha (Gautama Siddhartha) was not of Indo-Aryan stock. These suggestions were inspired by political motives and not supported

by sound evidence.<sup>1</sup> Now after Independence (1947), Indian scholars adduce adequate ethno-linguistic data in support of an Indic (Sanskrit) synthesis in which the Tibeto-Mongoloid races were partners with the Dravidians and the Aryans. Our National Professor of Humanities, Suniti Kumar Chatterji, with his characteristic objectivity, describes the Buddha as an Indo-Mongoloid.<sup>2</sup>

The Buddha's life and ancestry as well as his ethics and metaphysics constitute an un-Vedic and anti-Vedic tradition. He sprang from a republican tribe which the Buddhist chronicles identified as belonging to the Kshatriya *Varna*. Siddhartha, like his father Suddhodana, married within the prohibited degree, while the forebears of the tribe (Sakya) preserved the purity of their race through matrimony between cousins. The Buddha's denial of the authority of the Vedas, his rejection of the Vedic notion of soul and his hostility to the *Varna* system cannot be explained simply as a Kshatriya challenge to the Brahmana. In the present writer's contention the Buddha symbolized the non-Vedic and non-Aryan element which changed the course of Indian (and Asian) history. The epithet Tathagata, though ethymologically rendered, is not amenable to strict grammatical scrutiny. While the Central Asian documents read by Bagchi, Bailey and Thomas have made the original term more obscure, scholars like Conze and Lamotte suspect the word Tathagata as pre-Aryan.<sup>3</sup> The present writer would have no hesitation in describing the Buddha as of Tibeto-Mongoloid stock, nor will this wound the scholars of India today. The Tibetans—monks, scholars and laymen alike—will however consider such a proposition as blasphemy. In Tibetan belief the Sangs-rgyas (Purified One/Enlightened One = Skt. Buddha) as well as the Dam-chhos (Sacred Doctrine = Skt. Saddharma) originated in Phags-yul (Noble Land = Skt. Aryabhumi). In Tibetan memory, while some costumes and cuisine and social customs and secular institutions might have come to Tibet from the east or the north, all moral and intellectual items came from the south. In fact this total sentiment, rather than the mass of positive data, measures the

Indic impact on the Tibetan mind. Two events from the history of Tibet may be cited to illustrate the historical value of this sentiment.

When the need for a script was felt, the Tibetan authorities looked for a model in India and finalized one in the first half of the seventh century. Difficulties of adapting pictograph ruled out borrowing from China. Sanskrit alphabet (and Brahmi script) was however not the only phonetic medium known in Central Asia; Aramaic (Kharoshthi) for instance was widely prevalent. Tibetan acquaintance with several phonetic scripts prevailing in Central Asia is well known but the linguistic and morphological grounds which called for a Brahmi script (and a Sanskrit alphabet) are not known. Asked for the precise reasons for an Indic preference, a Tibetan scholar would answer thus: 'As we got the Sacred Doctrine from Aryabhumi we naturally sought a writing medium in Aryabhumi and there was no question of assessing the merits of the known scripts.' Eventually the Indic medium revolutionized the contents, the thought processes and the modes of expression in the Tibetan language. The role of the Sacred Letters is second only to that of the Sacred Doctrine in the history of Tibet.

The other event is the doctrinal debate between the Indian (Kamalasila) and the Chinese (Hoshang) in the last decade of the eighth century. The debate was necessitated by two different views on the attainment of Nirvana.<sup>4</sup> As modern researches bear out, either view was valid and the Tibetan support to the Indian exponent was really because he was a native of Aryabhumi and as such his exposition was accepted as authentic. In any case, the victory of the Indian Pandita was the reflex of Tibetan mind. The Tibetans ceremoniously expelled Hoshang from Tibet and banned for ever the preaching of Dharma by the Chinese. Till the 1950s the Expulsion of Hoshang was a popular mystery play in the monasteries of Tibet.

With the above prefatory remarks one may proceed to examine the peculiar political system which functioned in Tibet for over three hundred years (1642-1951). It was a system in

which authority finally vested in the monks (Lamas), and the hierarch (Dalai Lama) as the incarnation of Avalokitesvara (Tib. *Spyau-ras-gzigs*, pronounced *Chen-re-sik*) was 'the supreme civil and religious ruler of Tibet' and 'enjoyed a real divine right and unlimited prestige'.<sup>5</sup> While the actual administration was a sort of dyarchy of monks and lay elements, all powers—temporal as well as spiritual—belonged to the monks, the Gelugpa Lamas.

In the present writer's finding the capture of political power by the Lamas and the conduct of state business by the Lamas did not lack sanction in the Indic context.<sup>6</sup> Though Indian history does not provide any prototype for the Lamaist polity, Buddhist literature (Pali and Sanskrit) has enough to render legitimate government by the monks. This sanction is writ large in (i) the basic concept of early Buddhism ; (ii) the basic concept of Mahayana Buddhism ; and (iii) the Indic ethos which sought harmony between spiritual and temporal needs.

( i )

I take refuge in the Buddha

I take refuge in the Dharma

I take refuge in the Sangha

With the growth of a community of lay believers, the Sangha battling against *Jati-Varna* (caste and social inequalities) as well as *Jati-Marana* (mundane sufferings) was destined to become the refuge in a temporal sense. While the Buddha and the Dharma were intangible and transcendental objects, the Sangha was tangible and immanent. For its own merits like social and humanitarian services and for favour of the kings who took refuge in the Three Jewels, the Sangha could evoke submission without reservation. The promise of universal salvation in Mahayana evoked a deeper submission. In Mahayana the Sangha came to be designated as Bodhi-sattvagana, that is, a corporation of saviours who deferred their own Nirvana for the welfare of the entire community. The Sangha played the leading role in the migration of

Mahayana from the Indian plains to the Trans-Himalayan highlands and was from the beginning the leading Jewel in the Tibetan mind.

In the beginning, that is, for more than a century and a half, the Sangha in Tibet was composed of Indian monks and priests. As history bears out, they were men of character, learning and determination and individually they made deep impression, thus contributing to the high stock of the Sangha. The Sangha was not only the custodian of the Sacred Doctrine and the Sacred Script but also the instrument of a collectivist striving for salvation. The Bodhisattva doctrine had struck a responsive chord among nomadic and pastoral people.

Because of the socio-economic climate of Tibet and because of the needs of firm propagation, the Sangha did not keep any distance with the laity. Thus refuge in the House of Lamas (Bla-brang) was naturally sought in times of distress when the central monarchy broke down and people were oppressed by decadent aristocrats and rising brigands. Towards the beginning of the twelfth century, the Kargyu and Sakya Lamas had built monasteries which superseded in grandeur and authority the castles of the nomadic and pastoral lords. The great Lama rulers of thirteenth-century Tibet were the Rajagurus (Bakshi/Tisri) of the Mongol emperors and were called by the Tibetan devotees as Skyabs-mgon (Lord of Refuge). Refuge in the House of Lamas was anticipated when the great Indian saint-scholar Atisa, who came to reform the decadent Dharma (1042) and passed away near Lhasa (1054), had approved the Tibetan practice of prefixing 'refuge in the Lama' to the Refuge Formula. The formula was now

I take refuge in the Lama (Bla-ma or Guru)

I take refuge in the Sang-gye (Sangs-rgyas or Buddha)

I take refuge in the Chho (Chhos or Dharma)

I take refuge in the Gendun (Dge-hdun or Sangha)

( ii )

The thirteenth-century Lama-rulers made Tibet a first-class power of the day and had proved the entitlement to temporal

authority of a spiritual figure like 'the incarnation' (Skt. Nirmanakaya = Tib. Sprul-sku). Indian scriptures (Pali and Sanskrit) as well as Tibetan commentaries abound with mundane responsibilities of the Bodhisattva including grant of refuge, relief of distress and maintenance of law and order. As the Bodhisattva could take the form (Nirmanakaya) of a monk so he could take the form of a king. To reign, that is, to maintain law and order is a mundane obligation of the Bodhisattva.

The Sakya hierarchs were recognized as the incarnations of Manjusri. The Gelug hierarchs (Dalai Lamas) were recognized as the incarnations of Avalokitesvara. This had great temporal significance. In Mahayana texts, Avalokitesvara features as the topmost Bodhisattva ; he reigns without a rival ; he protects the weak and distressed in the manner of a universal sovereign. In Tibetan tradition Avalokitesvara is the founder and protector of the race. The *plenitudo potestatis* of the Dalai Lama was built as much on the Indian Buddhist canon as on the Tibetan national legends. But the Yellow Sect (Gelug Lamas) sought the sanction of their hierarch's political role in the original Dharma and designated the hierarch as the Skyabs-mgon (Lord of Refuge). This title flowed out of the Refuge Formula and recalled the *Saddharma-pundarika* episode of the Buddha being addressed as 'Mgon-po (Lord), Thou art the most excellent Skyabs (Refuge)'. The present Dalai Lama sticks to the historic title as is evidenced in the Tibetan text of the Constitution of Tibet promulgated from Dharamsala on 10 March 1961.

( iii )

The practice of monks and priests devoting themselves to state business is not contra Dharma. The Indian ethos as it had developed prior to the migration of Mahayana to Tibet favoured harmony between the spiritual and the temporal needs of existence. It had even admitted priority of the artha (material needs) over the dharma (spiritual needs) for a fruitful existence. The Vedic scale of values absolutely fixing dharma as paramount was later challenged in the artha literature. Eventually, dharma and artha came to mutual aid

as did the Brahmana and the Kshatriya. Buddhism likewise began with an antagonism between theology and statecraft, but could not deny for long the national ethos. The Buddhist diction right from its inception was fraught with temporal implications. The words chakra (चक्र) and chakravarti (चक्रवर्ती) or sasana (शासन) and (शास्त्र) conveyed temporal as well as spiritual attributes; sangha was as much a term of politics as of religion. While in Mahayana texts the Bodhi-sattva as king was a normal feature, in the Pali Vinaya, proficiency of a monk in worldly wisdom was not a sin. In later tradition Sramana along with Brahmana was found to be the root of society. In Tibetan tradition chhos (dharma) and srid (samsara) were described as complementary components in the way of life. The description Chhos-srid-gnyis-ltan (one which has both dharma and samsara) used in state papers of Tibet clearly brings this out.

The Indian concepts and ethos, as culled above from Pali and Sanskrit sources, are not to be construed as having shaped the history of Tibet. These Indian concepts and ethos provided the doctrinal background for the Lamaist state and are thus relevant to the history of Tibet.

#### N O T E S

0. All dates are in Christian era.  
Transcription of Sanskrit and Tibetan words is without diacritical marks.
1. Indian reaction is found in Jayaswal : *Hindu Polity* (Calcutta, 1924/Bangalore, 1943), Ch. XXI.
2. Chatterji : *Kirata-Jana-Krti* (Asiatic Society, Calcutta 1951), p. 93.
3. Edward Conze : *Buddhist Thought in India* (London, 1962), p. 172 f.n.
4. Paul Demieville : *Le concile de Lhasa* (Paris, 1952) and Giuseppe Tucci : *Minor Buddhist Texts*, Part II (Rome, 1958).
5. Words quoted are from a British handbook for official use, *Tibetan Precis* (ed. 1945, Richardson), p. 92.
6. This account anticipates a substantial portion of my forthcoming work on Lamaist Polity. Much of the textual data (Sanskrit and Tibetan) will be found in my papers contributed to *Bulletin of Tibetology* (Gangtok), Vol. V, Nos. 1-3.

## MISCELLANEOUS NOTES

### **Discussion Cultural Relativism at the Indian Philosophical Congress, 42nd Session, Patna (29 December 1968).**

We are glad that eighteen of the participants have raised questions relating to the three papers presented this morning by Dr. Prasad, Rev. de Marneffe and myself. Out of these, let me confine myself only to those which have reference to my paper.

The questions raised are of three kinds : (1) The first series relates to a definition of culture ; (2) the second is with regard to the caste system, and (3) the third is about the evaluation of cultures.

As I have already stated in the beginning of my paper that I am using the term 'culture' in a particular sense. I believe it is not necessary to go into the question as to whether that definition is valid, and there could not be a better or alternative ones.

It is also not necessary to deal with the second question relating to Caste. Caste was chosen only as an illustration ; any other institution could similarly have been taken up in its place, e.g. the family organization or democratic political organizations meant for local self-government, etc. My intention was only to illustrate how, on account of changing human experiences, the same institution plays a different role in the life of a people in course of time. Although there is an apparent continuity of form yet the function of the same institution may vary widely on account of new demands of life. The form of an institution may also consequently change to a greater or less extent.

Whether the historical picture of the caste system as presented by me is accurate or not is not immediately relevant to the question under discussion in the symposium. I have not tried to *defend* the caste system, but described in a broad sweep the values which it enshrined at different points of time in Indian history.

Everybody would substantially agree with the fact that both the form and function of human institutions change. The question to which we have to address ourselves is : Is one particular phase of an institution *better* than another ? Is there an absolute standard by means of which institutions, or even cultures or civilizations, as a whole can be evaluated ?

The third question alone therefore remains for our consideration.

Let me take up two very different cultures and value-systems, and see if we can compare them by means of any common standard.

The Eskimo live in a very harsh environment. There is almost always a chronic shortage of food ; and when the pressure becomes acute, it was one of the customs among the old men to perform a kind of suicide so that the rest of the community would be able to live by the slender resources which were still available. An old man might invite his son to strangle him to death by means of a leather thong. Or he might ask his sons to intern him in a stone house and then close the door completely by blocking the passage by means of stones which he would be unable to move. In other words, a man would thus refuse to be a drag upon his little community, and lay down his life voluntarily for their welfare. This was apparently regarded as a highly moral act.

Let us consider a Nation-State by way of comparison. During the last world war, millions of men and women were prepared to lay down their lives so that their nation could live in freedom. For instance, grave risks were taken by the Russians in Stalingrad, by English and American soldiers in the European and Pacific theatres of war in order to bring the war to a speedy end. In course of that noble adventure, the Americans also dropped the world's first atom bombs on Hiroshima and Nagasaki in Japan. As a result of this, and naturally of many other battles fought, the war came to an end. Humanity was apparently saved from further suffering.

Those who risked their lives, fought bravely, killed the enemy in large numbers, obviously felt that they were engaged

in a highly moral act, namely, the defence of the world from the dangers of Fascism.

Now, the question is : Is there any way by means of which we can evaluate comparatively the moral act of a single Eskimo who by laying down his life saves his children from starvation, and the sacrifice of millions of soldiers who laid down their lives in order to bring about an end of Fascism ?

Personally, I find it hard to decide as to whether one is superior to the other. Some of my friends would perhaps say that where, by means of a moral act, the lives of *many* people are saved, it is superior to another in which fewer people are affected. Or they might also claim that, if a civilization encourages *many* people to lay down their lives, then it is superior to another which encourages fewer people to do so.

The question which I would raise is : Is quantity then the absolute standard by means of which we determine the superiority of one moral act over another ? This mechanistic way does not have any appeal for me personally. To my mind, this is almost a vulgar way of saying that the bigger a thing is, the better it is.

In any case, I have tried in my paper to show that there can hardly be an absolute standard for the measurement of goodness or of progress.

And yet, we have indeed to judge if we have to live in the midst of fellow human beings. We have to, and do choose. We also judge.

All that I have tried to say is that if we examine the basis of our judgements, of the values which afford us a justification for our moral action, we discover soon enough that they arise because we are enmeshed by the sufferings of fellow human beings, and are trying to find a way out of them. The problems which we try to solve and the solutions we choose are all governed by contingent circumstances.

The question is : Are we justified in applying these very local and temporary standards to the evaluation of *other* lives and times, and of *other* civilizations ? We undoubtedly do so ; and even the need of that arises out of the demands of thought and action in the immediate present. But should these demands justify us in treating them as absolute standards ?

My suggestion is that they should not.

Nirmal Kumar Bose

## BOOK REVIEWS

**Race—A Christian Symposium.** Edited by Clifford S. Hill and David Mathews. With a Foreword signed by Archbishop of Canterbury, Cardinal Archbishop of Westminster, Moderator of Free Church Federal Council. Pp. 192. London, Victor Gollancz Ltd., 1968. 30 shillings net.

Since the termination of the second world war, England has received a very large number of immigrants from the Commonwealth countries. For example, Jamaica has been responsible for about 250,000 or more citizens (including those of Jamaican parentage), while among those who have gone from India and Pakistan, only perhaps 20 per cent can speak the English language, while many retain their Hindu or Moslem beliefs. This has created very serious problems all along the social and political frontiers, which eventually have led to serious riots against coloured folk in the last few years.

The book under review examines the problem of race-relations specifically from a Christian point of view. The best minds of England have been deeply touched by this explosion of racial prejudice. There is a belief that xenophobia had always been present in a latent state in the English mind; only, it has burst out in the surface today on account of several historical causes.

This collection of eleven essays from the pen of very competent scholars is a welcome addition to the literature on race. There is one chapter on the history of migrations, a second one on the biology of race, while one towards the end gives us an account of the reaction which the colour question has had upon three Christian immigrants from India, Africa and the West Indies. The other chapters mostly examine the question from a religious point of view. They are deeply inspired by the basic doctrines of Christianity; and suggest how one can effectively create a brotherhood among men only by reliance upon what Christ taught mankind.

It is a moving book; but it also indicates in a way the enormity of the problems facing mankind in a shrinking world, made possible by modern means of communication.

N. K. Bose

**The Hindu Avatars : Suggestions for their historical identification.**  
*By Amulyachandra Sen. Pp. 26. Sold by Saraswat Library, 206  
 Bidhan Sarani, Calcutta-6.*

Dr. Amulyachandra Sen's name is well known in the field of Indology. In the present pamphlet, he has suggested that the 'avatar stories may have originated from reports about the great kings of other lands' (p. 4). After a very original attempt at identification with some of the kings of Egypt, Babylon etc., he has tried to show that 'in the Puranic details (there is) a vague, faint or much blurred reflection of the historic achievements of the foreign kings' (p. 5).

N. K. Bose

**Hindu Society—An Interpretation.** *By Irawati Karwe. Second edition, 1968. Pp. xii + 180. Deshmukh Prakashan, Budhwar, Poona 2. Rs. 15.00.*

This is the second edition of a well-known book first published in 1961. It contains two new chapters, one of which happens to be the modification of a chapter in the first edition which has been dropped.

The principal thesis of Professor Karve is that *Jati* and *Varna* represent two different systems, the former being probably of pre-Aryan origin in India. The Aryans tried to accept it after modification, and thus made it their own. In the field of higher culture again, there was a constant accretion, just as there was constant agglomeration in the social sphere. This accretion of faiths was made possible by the way in which the Brahminical people looked at Absolute and Partial truths.

The book is thoughtful and stimulating.

N. K. Bose

**Democratic Socialisation and Participant Alienation in Mahi Village Panchayat (Kaira District, Central Gujarat).** *By Dr. K. C. Panchanadikar and Dr. (Mrs.) J. Panchanadikar. (Project Report submitted to the National Institute of Community Development, Hyderabad, Andhra Pradesh.)*

The field study in Mahi village was conducted between August 1961 and August 1962. Six villages responsive to community development programme were chosen as alternatives, to finally select one amongst them for intensive study. The study included

'the consequences of major-minor combinations within a community'. The field-work consisted of structured interviewing to study caste structure, inter-caste relations, social change under the impact of planned development since 1951, and the village administrative personnel.

The study consisted of four parts —

- (1) Community Setting and Determinants of Power, including Landed Assets and Adult Population, Educational Achievements and Caste Influence in Business Associations ;
- (2) Political Structuring and Socialization Process. The evolution of the Panchayat from May 1941 to March 1952 has been traced. Detailed study of the rural civic structure with reference to water supply and watch and ward has been made ;
- (3) Participant Alienation and Instability. The conditions in the Panchayat from March 1956 to February 1961 have been narrated ;
- (4) Political Consequences of Development Investment. The affairs in the Panchayat from February 1961 to February 1965 have been traced.

The interesting data that have been made available under various aspects of local administration are worth studying for further follow up. For instance, Table 18 reveals that 14 out of 80 meetings called had no quorum. During the 58 months of its tenure, this panchayat held meetings in each of the 50 months. The fifth panchayat passed an impressive total of 360 resolutions.

When there was a request through Government for grant of a larger plot of land for use as *Chamar-kund*, for tanning and processing of leather by the local Chamar caste, thus stressing on the panchayat the need to encourage and support the community's occupational venture, the panchayat, with great reluctance, resolved to part with 0.3 acre of its waste land. Similarly, the request of the Milk Producers' Co-operative for allotment of land for water-taps did not find a happy response from the panchayat. The authors conclude that these two episodes of lack of response on the part of the panchayat point to the total unawareness of the local authority of its responsibility to encourage and activate local occupational enterprise.

It has been stated that just as the national bourgeoisie is supplanted politically by the white-collar professional politician, in the rural areas it is being replaced by a class of vernacular and semi-English educated political bosses. When the question of housing the Vaghris, the backward community in the village arose, the panchayat instituted legal action against them for raising unauthorized hutments on the waste land without prior permission. The authors conclude that this incident reveals lack of understanding and the need to adequately motivate houseless sections of landless labourers if they are to be committed to agricultural work. In their view, the panchayat had no long-term vision and perspective of economic development.

An interesting study into what the authors call 'the Sociology of Developmental Credit' has been made of the loans distributed out of the Block funds. Out of 20 applications for agricultural and land-improvement loans, a sum of Rs. 67,750 was sanctioned to 12 families, all of whom happened to be Leuwias. There was a subsidy of Rs. 1,500 in each of the loans for the purchase of oil engines, which is the main attraction about these loans. The largest single amount of Rs. 23,000 was borrowed by the wealthiest landowner, who happened to be a tobacco dealer in the village. The economic concentration of power in the majority community community is revealed by the fact that out of 2,064 shares, the Leuwias held 1,753 and the non-Leuwias 311, in the three co-operatives.

The authors have made a useful contribution to the existing literature through this painstaking and careful evaluation of the impact of local development programmes on caste and community structure at the village level.

O. K. Moorthy

**The Year of the Gorilla.** By George B. Schaller. Pp. x+260. 1964. The University of Chicago Press, Chicago. \$ 5.95.

The author spent a year studying the Mountain Gorilla in an area where the province of Congo meets Uganda. The scientific account of their behaviour is presented in another book published by the University of Chicago, which is edititled *The Mountain Gorilla : Ecology and Behaviour*. The present book gives us a pleasant and popular account of the country where the author

worked. He tells us about the plants, mountains and rivers, and also about the gorilla who inhabit this region.

The description of nature often rises to poetic heights, and one is strongly reminded of Thoreau's *Walden* as he journeys through the forests in company with the author.

N. K. Bose

**The Sema Nagas :** By J. H. Hutton. Second edition. 1968. Pp. xviii + 467. Oxford University Press, Calcutta. Published by the direction of the Government of Nagaland. Rs. 40.

Professor J. H. Hutton's books on the Sema and Angami Nagas are classical works in Indian anthropology. This particular volume was first published in 1926; it was based on the author's work among the Sema between 1915 and 1920. Then the Sema were mostly 'Pagan', now they are nearly all Christian. A very great change has thus taken place in the course of the last fifty years. It is, therefore, all the more necessary that the ancient account should be made available to anthropologists and administrators; for both are deeply involved in the economic and political advancement of Nagaland.

We are glad that the Government of Nagaland is sponsoring the re-issue of these classics.

N. K. Bose

**Temples of Tripura.** By Adris Banerji. Pp. 22. + Frontispiece + half-tone plates + 2 line drawings. 1968. Prithivi Prakashan, Varanasi 5. Rs. 10 only.

Tripura lies near the eastern end of India. Near by is Buddhist Burma. The author of this small book has described in detail a number of temples in Tripura belonging to the 17th Century which show an interesting combination of the Bengali (Gauriya) Order and an element derived from Buddhist stupas. He also traces the early history of each of these orders to ancient times. Mr. Banerji's observations are original and convincing.

N. K. Bose

**Sea Routes to Polynesia : American Indians and Early Asiatics in the Pacific.** By Thor Heyerdahl. Pp. 232. 1968. George Allen and Unwin Ltd. Ruskin House, Museum Street, London. 42s. net.

Thor Heyerdahl has accomplished one of the most daring feats of seafaring in the present century. After a very careful study of

currents in the Pacific, and the sea-worthiness of Inca rafts, he sailed in 1947 on his famous Kon-Tiki expedition. His researches have never ceased ; and with the co-operation of archaeologists and botanists he has been able to show how the Incas of Peru were able to reach as far west as Polynesia. Archaeological excavations in the Easter Island indicate that there was a long succession of cultures spreading over more than a thousand years when culture was succeeded by culture until the Polynesians eventually came into dominance.

The book under review presents many of Dr. Heyerdahl's lectures or papers relating to the stratigraphy of cultures in the Pacific islands and of the dispersal of various food-plants, which offer almost unchallengeable evidence of American contact before the coming of the Spaniards.

One of the most fascinating chapters is formed by an account of the manner in which balsa-rafts were navigated by means of centre-boards raised or depressed, in conjunction with the manipulation of sails by the Incas. These rafts had no rudders ; but the extremely original manner in which they were navigated shows the mechanical ingenuity of the American people in question.

One of the most interesting features of Dr. Heyerdahl's work has been that, after each such re-discovery of ancient techniques, he tried them out himself by venturing in the open sea, when he was able to cross thousands of leagues in the same manner as the ancient people.

In one place, he says that he did not depend so much upon courage but confidence, which was undoubtedly the result of the meticulous care with which his researches were conducted.

It is a fascinating book which should be welcomed by every anthropologist and archaeologist. Both will end by admiring the scientific integrity as well as the intrepidity of an explorer of the first rank.

N. K. Bose

**Bankura : West Bengal District Gazetteers.** By Amiya Kumar Banerji. Pp. x + 624 + 18 art plates + maps. Calcutta : Government of West Bengal. 1968. Rs. 25.00.

Ever since the days of W. W. Hunter, gazetteers have been a special feature of the Governments' publications. There has been a steady evolution from Hunter's time till today ; and the present

volume produced by the Government of West Bengal admirably maintains the progressive trend observable in their production.

There are fifteen chapters which deal with the history of Bankura, its people, agriculture, industries, economic trends, administration, health, etc. These are followed by an account of places of interest.

An interesting feature of the book is formed by descriptions of social life, the schools of music, and 'the lives of eminent men of Bankura, like Ramananda Chatterji, which have been furnished by scholars who do not belong to the governmental establishment. This has added a new dimension to the value of the present publication. We only wish that this were also followed in other States of India.

The photographs and maps are of high order.

N. K. Bose

**The Tantric Tradition.** By Agehananda Bharati. London : Rider and Co., 1965. Pp. 349, bibliographical selection, index. 50s.

This is a difficult book, and is meant neither for a beginner nor for a layman, but for the 'initiated' who wants to know more of a philosophical tradition prevalent in India and Tibet. In fact, one has to read it slowly, and more than once to understand the ritual and religious background of a very sophisticated system of symbols.

The Tantric tradition has been subject to study both in the west and in the east for some decades, and has been misinterpreted quite often. Here, for the first time (in a European language), we have a balanced critical view, an analytical approach to the topic. Those who know Swami Bharati personally, the author of *The Yellow Robe*, the Austrian monk, who lived in India for some time and is now a professor of anthropology at Syracuse, will not be very much surprised to get such a book. His study is a useful contribution to research and theory in Tantricism in general. His theoretical concepts have been derived from linguistics, cultural anthropology, and philosophy and these have been used to unravel one of the 'esoteric' aspects of a very complex culture. I admit I have had hard times to follow him in one single reading. At the first glance, it may seem to be too much of a

western interpretation, but nowhere has Swamiji left gaps to understand the situation ; though some problems could have been raised and/or elaborated.

The book is divided into ten chapters which can be read separately. The first two chapters deal with the philosophical content of Tantra and Tantric terminology ; chapter 4, 'India and Tibet in Tantric Literature', emphasizes separation of traditions and lack of intellectual discourse between India and Tibet, though 'pilgrimage' stresses the potential erasure of physical separation. The use of language to produce certain effects has been well discussed in chs. 5 ('On Mantra') and 6 ('On Intentional Language'). Chapters 7 and 8 ('On Initiation'; 'Polarity Symbolism') bracket the induction of the disciple, aims. Chapter 9 brings together disciple, doctrine and goal in practice. Chapter 10 places Tantra against Indian and Western misconceptions of its nature.

Tantricism, as conceived and practised in India and in Tibet, is, in fact, formed by two different branches of one tradition ; in terminology, symbolism and in regard to goals they differ markedly. This has very carefully and logically been pointed out by Swami Bharati, though he has stressed the Tibetan doctrine throughout. Several important issues remain untouched in the book, e.g. the geographical restrictions of Tantricism ; the extent of Tibeto-Burmic *Weltanschaungen* in Tantricism ; the social and a-social aspects of the doctrine in the day-to-day life of a part of the country, specially as reflected in literature, some of which has been discussed in Edward Dimock's book, etc.

However, as a student of cultural anthropology and language and society in India, I propose to keep this book quite handy near my writing table. This is a wonderful book for which we must thank Prof. Bharati.

S. K. Ghose

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